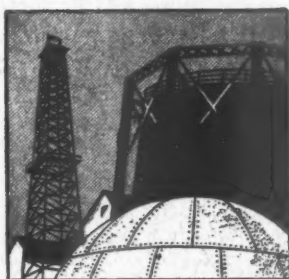


AMERICAN GAS ASSOCIATION MONTHLY



Stage Set
For Natural
Gas Convention

•

Hopkins Students
Inspect Industrial
Gas Installations

LAWRENCE E. BIEMILLER

•

Procedure in
Making Kitchen
Efficiency Studies

DR. LILLIAN M. GILBRETH

Where
is
Natural
Gas
Going
?

Completing
California
Changeover

•

Gas Engineering
at the University
of Michigan

E. S. PETTYJOHN

•

Selling
Gas-Fired Water
Heating in Brooklyn

FRANK D. TANSEY



May, 1930

Association to Offer Novel Course

AS a culmination of plans, two years in the making, formal arrangements have been completed for the launching of a Correspondence Course in Public Contact Training by the Committee on Education of Gas Company Employees of the American Gas Association. Estimates of enough enrollments have been received to more than satisfy the minimum requirements necessary to assure the preparation of the course.

This course will be written by J. David Houser and Associates. It will be based on the extensive experience of this organization in the analysis of public attitude toward utility companies and the training of employees in public and customer contact methods. Dr. H. R. Halsey and H. W. Schaughency of this

organization will prepare and administer the course. These men have been carrying out the training programs of Houser and Associates and are thoroughly familiar with the problems involved.

The course, while worked out for individual use by correspondence, will emphasize the group conference method. It will develop the broad principles of public and customer contacting, but will also contain much concrete material on the details of this work in specific contact jobs.

Both general information regarding the course as a whole—its aims, ideals, methods and contents—and specific information regarding suggested ways of handling it by company members will be furnished through various media.

AMERICAN GAS ASSOCIATION MONTHLY

Allyn B. Tunis, Editor

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Volume XII

MAY, 1930

Number 5

CONTENTS

	PAGE
Our Own Who's Who—Theodore V. Purcell.....	190
Where Is Natural Gas Going?.....	191
Stage Set for Natural Gas Convention.....	195
Procedure in Making Kitchen Efficiency Studies.....	198
DR. LILLIAN M. GILBRETH	
Completing California Changeover.....	201
A. FREEBURG	
A. G. A. Takes Part in A. S. M. E. Celebration.....	202
Hopkins Students Inspect Industrial Gas Installations.....	204
LAWRENCE E. BIEMILLER	
Industrial Business as Regards the Heavy Metallurgical Field.....	205
KARL EMMERLING	
World Engineering Congress in Japan.....	207
J. ARNOLD NORCROSS	
Selling Gas-Fired Water Heating in Brooklyn.....	210
FRANK D. TANSEY	
Gas Engineering at the University of Michigan.....	212
E. S. PETTYJOHN	
Convention Calendar.....	215
Affiliated Association Activities.....	216
Personal and Otherwise.....	217
Home Service as a Sales Activity.....	218
E. R. ACKER	
List of Convention Exhibitors Grows Rapidly.....	220
Joint Production and Chemical Conference.....	231
Monthly Summary of Gas Company Statistics.....	234

The Association does not hold itself responsible for statements and opinions contained in papers and discussions appearing herein.

Published Monthly by the

AMERICAN GAS ASSOCIATION

Publication Office, American Building, Brattleboro, Vt.
Editorial Offices, 420 Lexington Ave., New York, N. Y.

Entered as Second Class Matter at the Post Office at Brattleboro, Vermont, February 10th, 1922, under the Act of March 3, 1879.

Subscription Rate

\$3.00 a Year



Our Own Who's Who

THEODORE V. PURCELL

LX

THEODORE V. PURCELL was born in New York City and attended the public schools there. He graduated from Cooper Institute with the degrees of B.S. and M.E. and was first employed by the Equitable

Gas Company of New York in the drafting department where he progressed step-by-step until he was appointed Chief Engineer. He held that position until consolidation of the Equitable Company with the New Amsterdam Company.

In 1901 Mr. Purcell went to Chicago to take the position of general manager of the Ogden Gas Company. That company was subsequently leased by The Peoples Gas Light & Coke Co. with whom he remained as secretary. In 1924 he was elected to his present position of vice-president.

Mr. Purcell has served on many important American Gas Association Committees, and is at present Chairman of the Committee on Rate Structure.

AMERICAN GAS ASSOCIATION MONTHLY

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Where Is Natural Gas Going?

WHERE is natural gas going? Since the latter part of 1929 that question often has been asked in many forms. And the answer by C. W. Steffler, writing in *Commerce and Finance*, probably sums it up best. He stated: "Natural Gas has embarked upon a vast expansion program whose accomplishment promises to be greatly instrumental in shaping the industrial development of the future."

Natural gas is not a newcomer to the United States. About 1826 Fredonia, New York, forty miles from Buffalo, was using it commercially for illumination. The first town in the United States to be piped for natural gas for domestic purposes was Titusville, Penn., in 1872.

The recent rapid growth in the distribution of natural gas, and the development of projects looking to a still more widespread use, is due to the tremendous increase in the available supply and the pressure of finding markets. Its extension for long distances heretofore regarded as economically impracticable has been made possible by the construction of large-diameter, high-pressure pipe lines

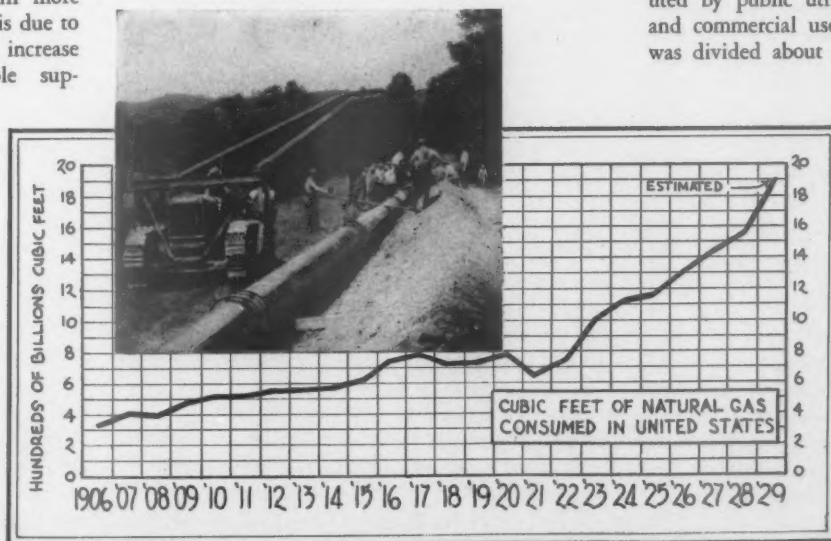
capable of transporting this gift of nature to distant markets. Last year, major pipe lines were completed to serve such important centers as Kansas City and St. Louis, Missouri; Memphis, Tennessee; New Orleans, Louisiana; San Antonio and El Paso, Texas; Monterey, Mexico; Salt Lake City, Utah; San Francisco and Oakland, California. Projects already finished or to be completed this year include lines to Atlanta, Georgia; Birmingham, Alabama; San Francisco, Santa Cruz and San Diego, California; Chicago, Illinois, and other leading cities.

New York, Pennsylvania, Maryland, Virginia, Kentucky, West Virginia, Indiana and Ohio are in an area where broad expansion of natural gas distribution is contemplated.

Decreasing production in the Pennsylvania and West Virginia fields, about 1921, led to the conclusion that the natural gas output had passed its peak. This condition caused the country as a whole to show a decline of 137 billion cu.ft. for that year as compared with the preceding twelve-month period. Existence of the huge gas reservoirs in Texas, Louisiana, Oklahoma, Kansas and California was not known at that time. As a result of these discoveries and the exploitation of the almost limitless supplies thus afforded, consumption of natural gas has since increased by leaps-and-bounds. Production in this country for 1921 was 662,000 million cu.ft. In 1928, this had grown to 1,567,877 million cu.ft., and last year this figure jumped to about 2,000,000 million cu.ft. Approximately 20 per cent was distributed by public utilities for domestic and commercial use. The remainder was divided about as follows:

Carbon	%
Black	11
Field Uses	37
Electric Power	
Generation	5
Refinery Uses	7
Other Miscellaneous	
Industrial	
Uses	20

By the application of science and engineering knowledge, the American Gas Association has largely as-



Courtesy The Magazine of Wall Street

sisted in clearing away misconceptions and handicaps under which the gas industry—both manufactured and natural gas—had been struggling. In this connection, Mr. Steffler writes:

"Another important development was the recent merging of interests and problems of the natural with the manufactured gas industry. This was accomplished through the consolidation of the Natural Gas Association of America with the American Gas Association, an organization devoted to the interest of the public and the progress of the greater gas industry of the United States. The A. G. A., through a nation-wide organization of departmental interests revolving around a central research laboratory (at Cleveland, Ohio), is doing constructive work in solving the industry's problems and elevating business standards. Already it has been found practical and economical to mix natural gas with manufactured gas, the resultant product having greater heating value than the latter as well as conserving the supply of the former. Furthermore, existing fixtures, appliances and mains designed for the manufactured product have been proved adaptable to the use of natural gas without prohibitive expense or great difficulty."

Predicting great industrial activity, stimulated by the facilities for cheap and abundant power, the *Manufacturers Record* avers:

"One phase of the increasing use of gas for industrial purposes which should not be overlooked is the nationwide creative advertising campaign which has been conducted by the American Gas Association to foster 'consumer acceptance' of gas. Through the educational appeal of the advertisements appearing in the *Manufacturers Record* and other publications, pointing out to the public the latest developments in gas-burning equipment and inviting prospective users to place their heating problems before the engineers of local gas companies, interest has been aroused which resulted in increased demand for gas for heating purposes. Likewise, developments in financing and building of pipe lines, and in the welding of pipe joints have been factors in the rapid expansion of these lines."

Despite the fact that Pittsburgh,

with its vast domestic and industrial requirements, has been supplied with natural gas for the past sixty years and Louisville, Buffalo, Cincinnati, Cleveland, Kansas City, Springfield, Columbus and Dallas have been dependent on it for many years, investors generally were, until recently, dubious about lending their money to help develop the industry.

Writing about this in *The Magazine of Wall Street*, M. David Gould says:

"There are at least four methods known to gas engineers whereby the available gas content of a field can be estimated with reasonable accuracy, and these methods are employed to check each other. These estimates have been relied on in the investment of millions of dollars in pipe lines to bring natural gas to Atlanta, St. Louis, Denver, Salt Lake City, Ogden, San Francisco, Memphis, New Orleans and many other points formerly considered outside of natural gas territory. The last-named lines and others totalling 3,540 miles have all been begun or completed within the past two years. In addition, a project sponsored by the Cities Service Company has been under way to bring natural gas from Texas to Chicago, a distance of 950 miles, and looking a little further ahead, observers see the time coming shortly when New York, Philadelphia, and the manufacturing districts of New England will be supplied with natural gas.

"This disposes of the other bogey of the natural gas investor. Where will the industry find markets to take its huge potential output, even if its life is assured for many years to come? There are three major areas in the United States in which natural gas is produced in great quantities: The Appalachian fields, including Pennsylvania, West Virginia and Ohio; the Southwest, including Louisiana, Texas, Oklahoma, Kansas and Arkansas; and the Pacific Coast, notably Southern California. Of these only the first is near large consuming areas.

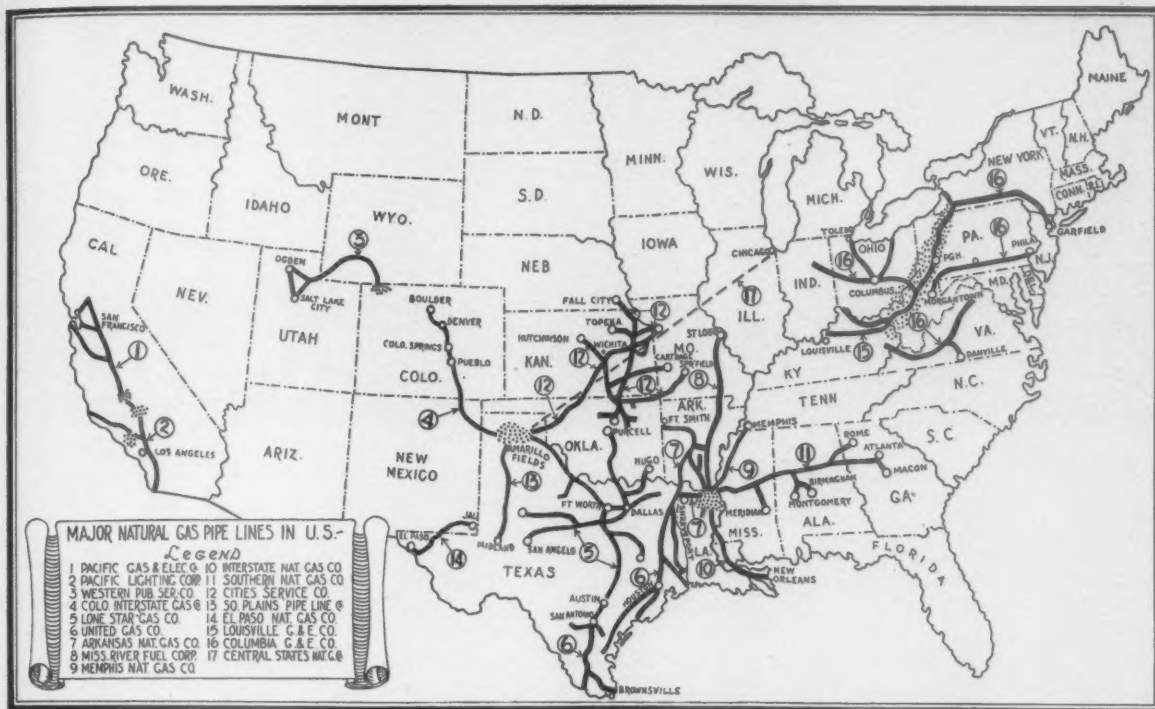
"The progress of the natural gas industry, it was felt, would therefore have to be limited to the development of the regions adjoining the natural gas fields, which are in general the same as the oil-producing areas. In recent years, however, steel pipe has

been developed which is capable of standing up under high gas pressures, running up to three and six hundred pounds per square inch. Long-distance transmission then became a possibility and, to the credit of the industry be it said, was quickly converted into an actuality as shown by the list of new cities opened up to natural gas supply mentioned above. All this is in addition to the rapid development of natural gas supply to smaller towns; in the Southwest alone, approximately a hundred new towns received natural gas for the first time last year.

"As a result, it has been estimated that over three-fourths of the area of the United States natural gas occupies a dominating position as a fuel. In six states the only form of gas used is natural gas, and in five more it constitutes over 90 per cent of all gas used. These eleven states include Texas and Ohio. In California, over 80 per cent of all gas used is natural, and in the great manufacturing state of Pennsylvania some 60 per cent of all gas produced is natural gas.

"Now that the new strong pipe line, capable of covering hitherto unprecedented distances, has proven its worth, it would be a rash man who would prophesy that any territory, even as far away from the gas fields as New England or the Pacific Northwest, would never enjoy the benefits of natural gas. These benefits are simple and specific. In addition to the merits it shares with manufactured gas, such as cleanliness, ease of regulation, saving of storage space and labor, safety, etc., it usually has twice the heating power of artificial gas (often running well over 1,000 British thermal units to the cubic foot, against the 540 B.t.u.'s which are a common legal requirement for manufactured gas), and it customarily sells for domestic use around 65 to 75 cents a thousand cubic feet, against \$1.00 to \$1.50 for the same quantity of manufactured gas. It is therefore small wonder that in many communities the turning-on of natural gas has been made the occasion for a public celebration."

When the change over from manufactured to straight natural gas was made in a group of California counties, the Coast Counties Gas & Electric Company reported that the first



Courtesy The Magazine of Wall Street

month's bills showed a reduction of 42 per cent, even though the first six or eight days were before the natural gas was turned into the mains. According to Pierre Vinet, new business manager of the company, this had a tendency to not only increase the sale of appliances, but more were sold for cash and a better quality of merchandise was purchased. He explained that the customers felt that they could afford to pay more for better equipment in view of the reduction in the cost of their fuel.

The writer in *The Magazine of Wall Street*, pointing to the trend toward consolidations, said that the natural gas industry may be expected to build up large operating and holding units, constructed in large part from the many present small operating natural gas companies. "If precedent may be safely followed," he explained, "as there is every reason to believe it can, the present holder of first mortgage bonds on a small property will find himself in the position of holding an underlying lien on a huge well-diversified system, with a consequent improvement in the investment status of his security, unless indeed his bond

is called in first, because of its high yield.

"The holder of common stock or options stands to profit even more," the article states, "through the probability of offers to exchange his holdings on favorable terms for stock in the larger and stronger units, enjoying greater marketability and prestige, and selling on a higher basis in relation to steadily increasing earnings.

"The natural gas industry is intimately connected with the oil business on the producing side, since natural gas is usually a by-product of oil field operations. Practically every natural gas field has been discovered incidentally in the attempt to locate oil. In addition, a large proportion of natural gas produced in this country contains gasoline vapors, which are easily condensed to form 'natural' or casing-head gasoline, which is useful because of its high quality for blending with gasoline produced by cracking oil.

"On the other hand, the transportation and marketing of natural gas presents such entirely different problems than those of oil that only a few oil companies have expended the necessary effort in the development of their

natural gas department so as to be able to participate substantially in the current development of the utilization of natural gas.

"Leaders among oil companies in this respect are the Standard Oil Co. of New Jersey, Standard Oil Co. of New York and Phillips Petroleum.

"Natural gas companies are often intimately associated with electric power and light concerns. Not only do the latter often control gas companies operating in the same cities, but in addition, many electric power steam generating stations have been converted to the use of natural gas under their boilers as a fuel replacing coal or fuel oil. One Southern station alone has a contract to purchase 4,000,000 cubic feet of gas a year for this purpose.

"The Electric Power & Light, through its recent merger with United Gas Co., is one of the leaders of the electric utilities now taking an interest in natural gas. Columbia Gas & Electric dominates the natural gas situation in the state of Ohio, and is understood to be extending its operations aggressively to the East. Louisville Gas & Electric and certain other subsidiaries



of Standard Gas & Electric are operating aggressively in the field of natural gas development and distribution.

"The third type of company which stands to benefit substantially by natural gas development is the gas producer, owning substantial production from developed fields and selling its gas at wholesale to large industrial consumers and to other gas companies. An outstanding example of this type is Lone Star Gas. Certain other companies in this group, not having had until recently a satisfactory outlet for much of their production, have used it for the manufacture of carbon black. This is far from the most economical way of utilizing natural gas, but it solves the problem of obtaining an immediate return and gas production can be gradually diverted to the more profitable channels of industrial and domestic consumption as new outlets are found.

"Outstanding companies of this type are Columbian Carbon and United Carbon, which, last year, began supplying natural gas to St. Louis in conjunction with five other producers. In the case of these companies, not only the volume of production, but realized profit per thousand cubic feet should increase steadily as less profitable outlets for natural gas are displaced by more profitable ones."

Standard Statistics Service gives an interesting picture of the natural gas industry in the following words:

"The future development and extension of the natural gas industry will follow directly the lines of progress through which the electrical industry has passed, for the two are closely

analogous. In the case of the latter, the object has been to bring cheap hydroelectric power from points where it can, for geographical reasons, be most economically produced, to the large centers of population and industry, to be sold there in conjunction with steam-electric energy generated nearby. Similarly, natural gas must be transported from points where it may be gathered cheaply and in plentiful supply to the same centers, to be there distributed in competition or conjunction with gas manufactured at nearby plants.

"This has led in the electric field to the establishment, under holding companies, of super-power systems. It is now, in the natural gas industry, tending toward the formation of super-gas companies.

"We confidently predict the formation of holding company alliances of natural gas producing, transporting and distributing companies during early future years, with accompanying profits to be made by investors through a careful selection of stocks.

"Impelled by circumstances essentially similar to those which brought about the formation of the present super-power systems, the gas industry is entering a corresponding stage, leading to the alliance of those companies holding rights to natural gas reserves with companies in a position to give natural gas wide distribution on the delivery end. The leading producing companies, as well as the leading gas distributing companies, are in most cases in strong hands, however; hence a scramble for the control of either is not a probability, although some small

scale operations of this nature seem inevitable.

"Unification of these interests will more likely come about through joint ownership of transportation facilities, but profits will accrue to the companies at either end. While the distributing companies stand to benefit from increased sales, lower costs and capital savings, the producing companies are in a position to profit additionally from the exploration of fields and location of additional reserves."

Undoubtedly the natural gas industry is coming into its own through the formation of new operating and financing companies which will make possible the full utilization resources on a magnificent scale. The larger oil companies also have taken a new viewpoint on natural gas operations and have gone into the natural gas business in a large way.

In making gas available to new territories the gas companies are adding impetus to development of great industrial possibilities of the regions traversed, and already industrial activity is being quickened as the benefits of natural gas are fully grasped. The Pacific Gas and Electric Company is conducting a national advertising campaign calling industry's attention to the supply of natural gas available now in the San Francisco Bay Area.

The combined picture of natural gas operation, distribution and financing changes overnight. The industry is regarded as something new. Industrially this is so, but actually the knowledge of the existence of natural gas runs back down the centuries.

(Continued on page 233)



Stage Set for Natural Gas Convention

ENTERTAINMENT promises to be one of the outstanding features of the Annual Convention of the Natural Gas Department, American Gas Association, which will open at New Orleans, May 5 and continue through May 8.

Before the business sessions get underway, the first round of pleasures will take place. This will be in the form of a sightseeing boat trip around the harbor and Mississippi River. The steamer Capital will leave the foot of Canal Street at 2:30 o'clock Monday afternoon. An orchestra will be aboard to furnish music for dancing.

At 9:00 o'clock Monday night there will be a grand ball in the Tip Top Inn, twelfth floor of the Roosevelt Hotel, which will be Convention Headquarters.

A special pedestrian tour through the *Vieux Carre*—the old French, Spanish and Creole quarter—has been arranged for the ladies at 10 o'clock Tuesday morning. This will be followed by a luncheon.

"A Mardi Gras in May" is the title given a stag smoker and carnival, which will take place in the Tip Top Inn at 8:30 o'clock Wednesday night. Music and entertainment galore, in addition to a riot of fun, are promised for this event.

At 8:00 o'clock Wednesday night a

tour of old New Orleans—*Une Soiree Dans La Vierge Nouvelle Orleans*—has been arranged for the ladies. It will start promptly from Le Petit

ALBERTINE BERRY, home service director of the San Antonio Public Service Company, San Antonio, Texas, will have the distinction of being the only woman speaker on the program of the Annual Meeting of The Natural Gas Department at New Orleans. She will speak on "Home Service."



Theatre du Vieux Carre, 616 St. Peters Street.

The following Convention Committees are in charge:

Arrangements and Entertainment Committee—A. B. Paterson, Chair-

man, New Orleans, La.; Wallace Blocker, Houston, Texas; O. Christopher, Baker, Mont.; R. W. Gallagher, Cleveland, Ohio; N. K. Moody, Independence, Kans.; R. C. Hoffman, Jr., Atlanta, Ga.; J. R. Munce, Shreveport, La.; F. F. Schauer, Pittsburgh, Pa.; C. N. Stannard, Denver, Colo.; T. R. Weymouth, Tulsa, Okla.; W. S. Yard, San Francisco, Cal.

Program Committee—N. C. McGowen, Chairman, Shreveport, La.; F. L. Chase, Dallas, Texas; W. A. Dunkley, Memphis, Tenn.; L. Fitzpatrick, Salt Lake City, Utah; A. C. Howard, Houston, Texas; A. E. Merchant, New Orleans, La.; H. L. Montgomery, Bartlesville, Okla.; T. J. Strickler, Kansas City, Mo.; George Wehrle, Denver, Colo.

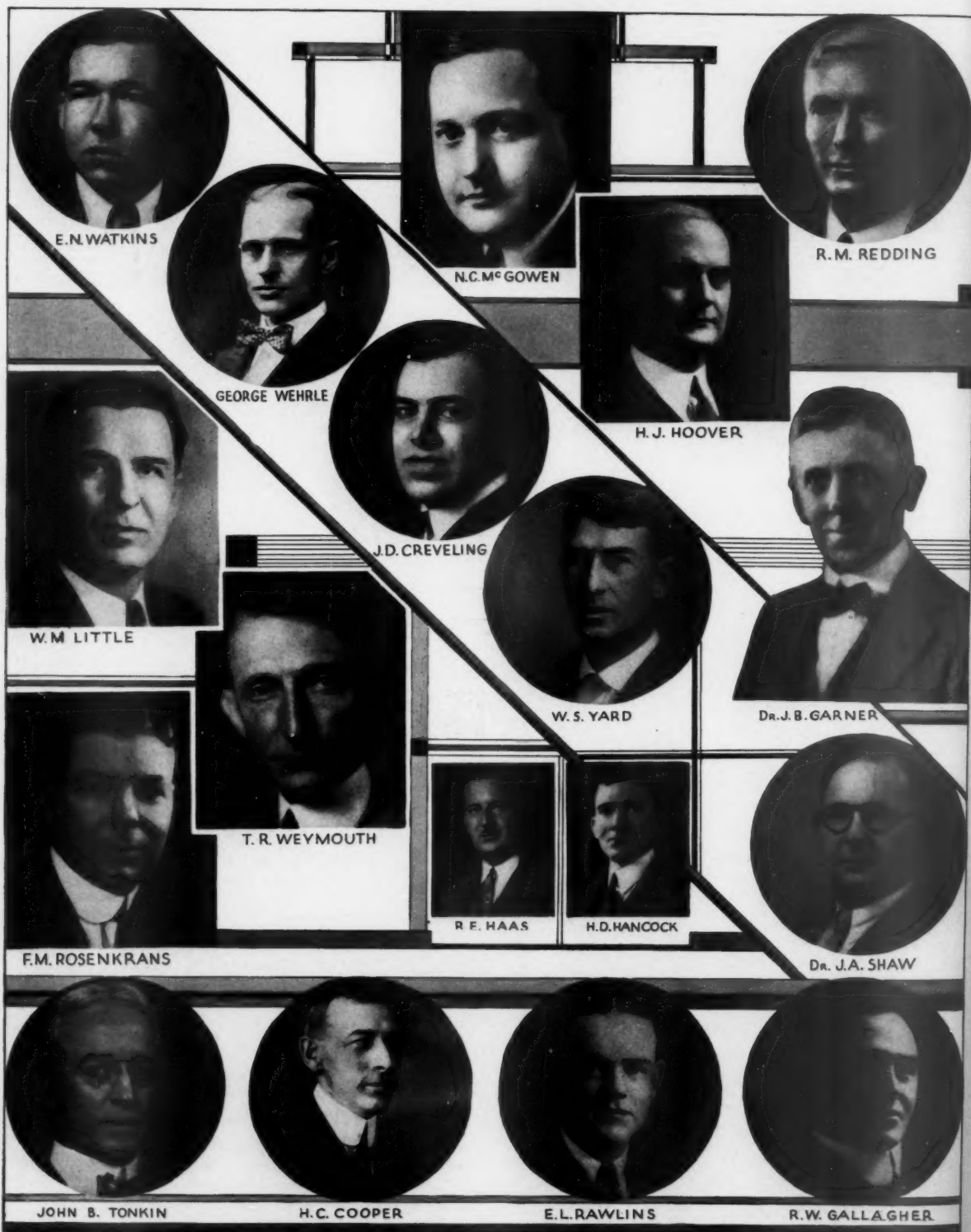
Publicity Committee—J. C. Barnes, Chairman, New Orleans, La.; R. J. Daugherty, Bartlesville, Okla.; John Fletcher, Shreveport, La.; William C. Grant, Dallas, Texas; C. D. Greason, Kansas City, Mo.; Reid McBeth, Tulsa, Okla.

Miss Henryetta Bayle will be in charge as General Chairman of the Ladies' Committees, with Miss Almira Dauenhauer as General Chairman, *ex-officio*. The Ladies' Committees are as follows:

Registration—Miss Salassi, Chairman, Miss Mabel Neimeyer, Sub-Chairman, Elizabeth Bell, Leah McMahon, Elsie Sherlock, Elaine Baxter, Juliette Berthelot.

Boat Ride—Miss Margaret Campbell, Chairman, Miss Hyacinth Joyce, Sub-Chairman, Corinne Fleetwood, Elise Burguières, Eloise Phillipi, Ethel Reilly, Talie Plaisson.

To Speak at New Orleans Meeting



Dance—Miss Elise Waggaman, Chairman, Miss Eva Dietlein, Sub-Chairman, Dot Grube, Elizabeth Ferguson, Estelle Bowers, Margaret Moore, Mattie Bell Maxwell, Norma Kirkpatrick.

Vieux Carre—Miss Philo Tobin, Chairman, Miss Edith Mayor, Sub-Chairman, Henryetta Meyers, Virgie Fisher, Nelle Everett, Mildred Roome, Catherine Howe, Marguerite Hugo.

Theatre Party—Miss Ethel Ryan, Chairman, Miss Katherine Fitzpatrick, Sub-Chairman, Annie Mooney, Irene Rand, Bertha Sondes, Leila Wren, Ruby Simon, Mabel Triay.

Transportation—Miss Alice Cooper, Chairman, Miss Lillian Heft, Sub-Chairman, Bess Piquet, Elizabeth Moore, Margaret Finley, Claire Rainey, Miriam Green Jesse, Kate Fleming.

H. C. Morris, Chairman, Natural Gas Department and E. J. Stephany, Secretary, anticipate an unusually large attendance at this year's meeting.

As an added inducement for members to participate in the Convention, arrangements have been made with railroads for reduced fares to and from New Orleans. A reduction of one and one-half fare on the certificate plan will apply to members and their dependent families. The selling dates for purchase of tickets are May 1 to 7—with May 12 as a final limit for return with the exception of the following territories, where the dates are:

April 27-May 3—Return limit May 12. Oregon, via California.

April 28-May 4—Return limit May 12. California.

April 29-May 5—Return limit May 12. Arizona, British Columbia, Idaho, Montana, Nevada, Oregon (except via California), Utah and Washington.

April 30-May 6—Return limit May 12. Colorado, except Julesburg, New Mexico, Wyoming, New England, El Paso, Texas.

The program of business sessions follows:

TUESDAY, MAY 6

MORNING—9:30 O'CLOCK

Tip Top Inn

Opening Remarks by the Chairman
H. C. Morris, *Chairman*,
—Natural Gas Department.

Invocation

Rev. Father P. M. H. Wynhoven,
Gretna, Louisiana.

Address of Welcome

Hon. T. Semmes Walmsley,
Mayor of New Orleans.

Address of the Chairman

H. C. Morris,
Dallas Gas Company,
Dallas, Texas.

Appointment Committee on Chairman's Address

H. C. Cooper, *Vice-Chairman*,
Natural Gas Department.

Secretary's Report

E. J. Stephany,
Dallas, Texas.

Natural Gas, America's Newest Giant

B. J. Mullaney, *President*,
American Gas Association.

Five Minutes with Headquarters

Alexander Forward, *Managing Director*,
American Gas Association.

Commercial Sales

F. M. Rosenkrans,
Gas Service Company,
Kansas City, Mo.

Wrinkles

H. J. Hoover,
Cincinnati, Ohio.

Collecting Natural Gas Statistics

R. W. Gallagher,
East Ohio Gas Company,
Cleveland, Ohio.

AFTERNOON—1:30 O'CLOCK

Tip Top Inn

Natural Gas Fellowships

J. B. Tonkin,
Peoples Natural Gas Company,
Pittsburgh, Pa.

Natural Gas Developments on the Pacific Coast

W. S. Yard,
Pacific Gas and Electric Company,
San Francisco, Cal.

Our Main Technical and Research Committee

H. C. Cooper,
Hope Natural Gas Company,
Pittsburgh, Pa.

Gas Measurement

T. R. Weymouth,
Oklahoma Natural Gas Corporation,
Tulsa, Okla.

Pipe Line Flow

H. D. Hancock,
Henry L. Doherty and Company,
New York, N. Y.

Gas Well Delivery Capacities

N. C. McGowen,
Louisiana Gas and Fuel Company,
Shreveport, La.

Leak Detection and Prevention in Congested Cities

Dr. J. B. Garner,
Peoples Natural Gas Company,
Pittsburgh, Pa.

WEDNESDAY, MAY 7

MORNING—9:30 O'CLOCK

Tip Top Inn

Pipe Protection

George Wehrle,
Public Service Company of Colorado,
Denver, Colo.

Building Domestic Load by Selling Appliances

W. J. MacIntyre,
Southern Cities Distributing Company,
Shreveport, La.

Conservation in Louisiana

Dr. J. A. Shaw,
Department of Conservation,
Shreveport, La.

Home Service

Miss A. Berry,
San Antonio Public Service Company,
San Antonio, Texas.

Activities of a Public Relations and Advertising Department

R. E. Haas,
Columbia Gas and Electric Corporation,
New York, N. Y.

AFTERNOON—1:30 O'CLOCK

Tip Top Inn

Open Forum

J. D. Creveling of Henry L. Doherty and Company will preside. The following subjects, and others, will be open for general discussion:

Handling Water in Wells

Discussion Leader, J. H. Dunn,
Lone Star Gas Company, Dallas,
Texas.

Recent Progress in the Saturation of Natural Gas with Oil and/or Water.

Discussion Leader, H. L. Gaidry,
New Orleans Public Service, Incorporated,
New Orleans, La.

The Relative Advantages of Displacement and Orifice Meters.

Discussion Leader, George B.

(Continued on page 232)

Procedure in Making Kitchen Efficiency Studies

THE first step in the preparation of an efficiency study of a kitchen, is to state the conditions in definite terms: First, general statement of use, space, time and money requirements, and second, material requirements for storage, transportation, containers, preparation, operations, and clean-up.

It was assumed that the kitchen was to serve and to be used by a family (father, mother, baby and a child old enough to help a little with the work). The same operation principle applies to a house with a maid.

Space

The study as conducted was limited by the fact that the kitchen size had to be approximately 10' and 12' in order to utilize the space assigned for this kitchen in the Exposition of Woman's Arts and Industries. And the problem was further complicated by the necessity of providing space for the passage of visitors but the principles of the circular work spaces, posture of the worker, et cetera (as illustrated) can be applied to other sizes of kitchens or other working room.

Material Requirements

In order to better illustrate the principles of efficiency engineering, a simple problem, the making of a cake, was selected. The material requirements were refrigerator, kitchen cabinet, stove, sink, service table, dish cupboard and dining table.

Analysis of Processes

An ordinary kitchen, see plan on next page, was assumed and all the processes involved in making cake in this kitchen gone through. Fifty op-

Even the best and most efficient of our present day apartment kitchens fall far short of the efficiency methods which are being applied to industrial processes. Some attention has been paid in kitchen planning to the problem of correct routing of work but almost no attention has been given to the equally important problems of circular work spaces and correct working heights for each individual. For example, the generally accepted height of 36" may be right for thirty or forty per cent of the women and quite inconvenient for the balance. The study which follows is the outgrowth of the belief of Miss Mary Dillon, President of the Brooklyn Borough Gas Company, that kitchens needed engineering thought in order to reduce effort. She therefore engaged an efficiency engineer, Dr. Lillian M. Gilbreth, to study the kitchen as an industrial production problem. The outstanding conclusion of this study, which was published as herewith in the Architectural Record last March, was that the modern kitchen, although it possesses many attractive appliances and appears to be efficient, is far from approaching the efficiency standards that prevail in the best industrial plants.

erations were noted and a total of 143 feet would be walked in the preparation of this cake. The analyses of this project are shown in the adjoining Process Chart.

Making Efficiency Plan

The method of working our plan which would reduce the number of processes was quite simple with the cooperation of Miss Jane Callaghan of the Brooklyn Borough Gas Company. Dr. Gilbreth made scale drawings of the furniture which were then cut from stiff paper and moved about on a floor plan and the length of the worker's reach, roughly half the distance from finger tip to finger tip when the arms are outstretched sideways—was taken on the compasses and used to test each grouping.

A drawing was made of the best arrangement and the process chart revised accordingly.

When a string plan was made on the improved layout, it was found that only about one-sixth the original amount of walking was required, and all of it was "get ready" and "clean up" and none of it in the actual making of the cake.

This rearrangement of the equipment resulted in reducing the number of operations from 50 to 24 and reduced the distance to be walked from 143 feet to 24.

Routing

The relationships of equipment obtained by an analysis of the process was related to the room and to other processes. The delivery man deposits milk, eggs, and groceries inside the rear door without having to go through the kitchen.

The homemaker places them with little effort inside the refrigerator and kitchen cabinet. Cooking materials are then transported with little effort to the cabinet table and prepared for the stove. Food when cooked is routed from stove to sink or service table, from thence to dining table and after the meal to refrigerator, cabinet, sink, et cetera, as the case may be.

Circular Work Space

The circular work space idea has been carried through in the planning of this kitchen. If the housewife stands at the point indicated by the footprints on the floor plan, she is within easy reach of the major portion of the equipment which needs to be used in most cooking projects. The chair before the planning desk forms the center of a circular work space which would be used while planning meals or ordering. Other centers would be set up for other processes such as dishwashing, where the movable service table would function.

In this kitchen there has been a very careful attempt to stress the proper height of work place and equipment. A woman 5' tall was selected as the housewife and everything possible adjusted to fit her. The work place was measured in its relation to the height of the elbows of the worker when standing.



Demonstration Kitchen of Brooklyn Borough Gas Company, Based on Motion Study

(She should stand erect with arms comfortably relaxed and the work place be so arranged that she may do the work with greatest comfort in that posture.) When she is seated, her work place should remain at the same relative height to her elbows. In the selection of the equipment certain heights had of course to be considered, the working surfaces in the refrigerator, the height of the working surface of the stove and kitchen cabinet. It was possible to make heights only relatively right by selection of legs of equipment bringing it to most nearly the right height, raising the height of the work table, selection of such smaller pieces of equipment as will keep the worker as nearly as possible in the right relation to her work.

Planning Desk

This is perhaps one of the most important new additions to equipment of efficiency kitchen and one that is seldom provided. The homemaker can check the supplies in the refrigerator and the kitchen cabinet from her chair by the



Dr. Gilbreth

planning desk. Receipts, cookbooks and bills are kept in this desk.

Kitchen Cabinet

The kitchen cabinet was one of the newest and most efficient on the market but Dr. Gilbreth says, "From the standpoint of the efficiency engineer all kitchen cabinets need to be restudied by their manufacturers. The aims are excellent but they have not been thought through in terms of final use in connection with other equipment. The selection of this model cabinet, and the fact that it is possible and advisable to place it near the stove, has far-reaching effects on the placing of cooking materials, utensils, etc."

"An efficient kitchen cabinet should be flexible as to height. The working surface should as nearly approximate a correct work place as is possible. This thing has not been considered in any kitchen cabinet now on the market which I have seen. Drawers, cupboard, etc., which are all a part of it should be arranged so as not to interfere with the comfort of the seated user. Doors should be made so as not to interfere with the use of any part of the cabinet when open or with the use of the stove, the sink, the work table, or anything else used in conjunction with the kitchen cabinet."

The kitchen cabinet should not be

designed as an attractive piece of furniture into which various types of equipment used in cooking can be put, but as an efficient and attractive container making as many as possible of the things used in cooking available to the user with the fewest and most comfortable motions. The operations done in the kitchen should be studied; the materials and equipment for these operations placed in the best positions possible and the kitchen cabinet built around these.

Refrigerator

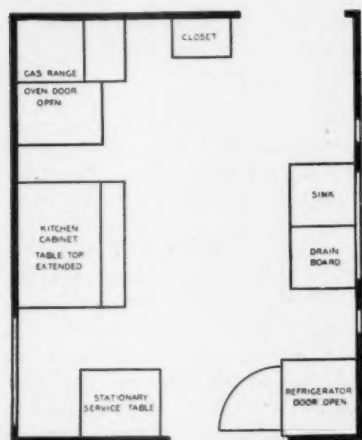
The refrigerator chosen was the model separate from the stove, as it was felt that the combination refrigerator and stove did not offer sufficient refrigeration space for the family of four. The white model was chosen as apt to fit into more color schemes and perhaps suggesting absolute cleanliness to the housewife. The size was that thought best fitted to her needs and her purse.

The refrigerator is still handicapped in design by the old type of refrigerator which required ice. It should be possible to make a refrigerator more nearly meeting the needs of the individual user. The present refrigerator is so high that its top cannot be used for a work place. There might be flexibility as to the placing of the various shelves and compartments, to suit the varying food supply of the family using the refrigerator. The



Miss Dillon

Process Chart—
Making a Coffee Cake
Original Layout of Kitchen

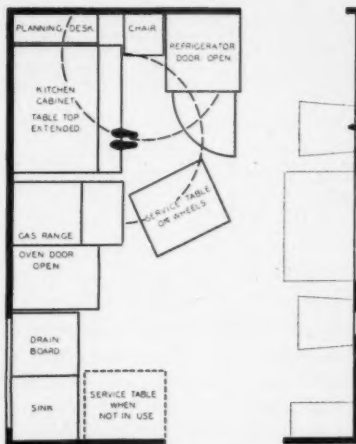


Original kitchen layout—fifty processes and one hundred forty-three feet of walking

- 1 Light oven
- 2 Walk to kitchen cabinet
- 3 Open kitchen cabinet, assemble recipe and dry ingredients
- 4 Walk to closet
- 5 Assemble pans, bowls, spoons, etc.
- 6 Carry pans, etc., to kitchen cabinet
- 7 Assemble pans, etc., on kitchen cabinet
- 8 Carry pans, nuts, sugar-and-cinnamon to table
- 9 Assemble pans, etc., on table
- 10 Walk to refrigerator
- 11 Open refrigerator, collect eggs, milk, butter and oil. Close refrigerator
- 12 Carry eggs, etc., to kitchen cabinet
- 13 Assemble eggs, etc., on kitchen cabinet
- 14 Measure ingredients
- 15 Carry butter to stove
- 16 Place butter on stove to melt
- 17 Return to kitchen cabinet
- 18 Carry oil to table
- 19 Grease pans
- 20 Return to kitchen cabinet
- 21 Mix cake
- 22 Carry cake to table
- 23 Pour cake into pans
- 24 Walk to stove
- 25 Carry melted butter to table
- 26 Put butter, sugar-and-cinnamon and nuts on cake
- 27 Carry cake to oven
- 28 Place cake in oven
- 29 Remove cake from oven
- 30 Carry cake to table
- 31 Remove cake from pans and set to cool
- 32 Carry remaining supplies to kitchen cabinet
- 33 Place recipe, nuts and sugar-and-cinnamon in kitchen cabinet
- 34 Carry remaining milk, butter and oil to refrigerator.

- 35 Place milk, etc., in refrigerator
- 36 Return to kitchen cabinet
- 37 Assemble used utensils
- 38 Carry used utensils to sink
- 39 Walk to table
- 40 Carry used pans to sink
- 41 Wash and dry utensils and pans
- 42 Carry utensils and pans to closet
- 43 Place utensils and pans in closet
- 44 Return to sink
- 45 Carry dishcloth to kitchen cabinet
- 46 Wipe off and close kitchen cabinet
- 47 Carry dishcloth to table
- 48 Wipe off table
- 49 Carry dishcloth to sink
- 50 Tidy sink, wash dishcloth and towels and hang to dry

Process Chart—
Making a Coffee Cake
Improved Layout of Kitchen



Improved kitchen layout—twenty-four processes and twenty-four feet of walking

- 1A Light oven (covers 1)
- 2A Walk to kitchen cabinet and adjust service table
- 3A Open kitchen cabinet, assemble recipe, dry ingredients, pans and utensils on kitchen cabinet and service table (2, 3, 4, 5, 6, 7, 8, 9)
- 4A Open refrigerator, collect eggs, milk, butter and oil (10, 11, 12)
- 5A Assemble eggs, etc., on kitchen cabinet (13)
- 6A Measure ingredients (14)
- 7A Place butter on stove to melt (15, 16, 17)
- 8A Grease pans (18, 19, 20)
- 9A Mix cake (21)
- 10A Pour cake into pans (22, 23)
- 11A Reach for melted butter, put butter, sugar-and-cinnamon and nuts on cake (24, 25, 26)
- 12A Place cake in oven (27, 28)
- 13A Turn off oven and remove cake from oven (29)
- 14A Place cake on service table, remove from pans, set to cool (30, 31)

- 15A Place recipe, nuts and sugar-and-cinnamon in kitchen cabinet (32, 33)
- 16A Place milk, etc., in refrigerator (34, 35, 36)
- 17A Place utensils on service table (37)
- 18A Move service table to sink (38, 39, 40)
- 19A Wash and dry utensils and pans and place on utility table. Add dishcloth (41)
- 20A Move service table to kitchen cabinet (42, 44, 45)
- 21A Replace pans and utensils in kitchen cabinet (43)
44 covered by 20A
45 covered by 20A
- 22A Wipe off and close kitchen cabinet (46, 47, 48)
- 23A Carry dishcloth to sink (49)
- 24A Tidy sink, wash dishcloth and towels and hang to dry (50)

new type of refrigerator comes into the kitchen and might serve many purposes which it could not serve when it was out of doors.

In time a refrigerating unit may be designed, this to be housed in a container which will fit into the kitchen-unit.

Stove

The stove was selected primarily because of its safety features. Those are imperative with small children in the family. Not only do the safety devices on the handles controlling the gas make this an especially desirable model where children come into the picture, but the attachment for the kettle and other cooking utensils for long, slow time cooking, serves as a protective device for children who might otherwise tip some hot food over on themselves. The surface of the range should be such as to make it comfortable to use when standing. The heights of ovens, etc., should be thought through with reference to both standing and sitting users. The circular work place should be considered here also. As in the case of the kitchen cabinet, all uses of the stove should be considered and the easiest motions for these used. The stove should then be designed to make these easy motions possible.

Sink

One cannot use any sink available for dishwashing efficiently without adding such accessories as rubber mats, wooden racks, and a basket for drying

(Continued on page 232)

NATURAL GAS

will be served beginning January 3, 1930. Due to the high heat content of new NATURAL GAS all gas appliances will be inspected by trained men and minor adjustments made without charge.

UNTIL YOUR APPLIANCES ARE ADJUSTED:

- 1—Turn off your gas water heater.
- 2—If you use your oven, have the flame turned low.
- 3—Heaters, and the open top of your gas range should be turned low.
- 4—The gas flow to the furnaces should be reduced.

COAST COUNTIES GAS & ELECTRIC CO.

Left—Card mailed to all customers before changeover. Below—Changeover Crew of the Coast Counties Gas & Electric Company at Pittsburg, Calif., with insert showing adjustments being made to household appliances.



Completing California Changeover

By A. FREEBURG

Coast Counties Gas & Electric Company

THE changeover from manufactured to straight natural gas has been almost completed in the territory of the Coast Counties Gas and Electric Company of Santa Cruz, California. The service of this super-fuel went first to the Hollister district of the company, and followed shortly afterward at Gilroy. Then service was given the great industrial section of Contra Costa County and the final changeover in the southern division was made at Santa Cruz and Watsonville.

New distribution systems and the necessary transmission lines also have been laid for the service of natural gas to the towns of Morgan Hill, San Martin, San Juan Bautista, Aromas and Tres Pinos in the southern division, as well as Walnut Creek, Danville and Bay Point in Contra Costa County.

This is only a small part of the program of development contemplated by the Coast Counties Gas and Electric Company this year, and many additional extensions are being laid in the towns where service is already available, because of the popularity of this new fuel.

Stations for the measuring and regulating of natural gas also were erected in Watsonville, Gilroy Junction, Morgan Hill, San Martin and Gilroy.

The changeover throughout the Coast Counties territory was made directly from manufactured to straight natural gas, mixed gas being at no time served in this area.

All of the straight natural gas served by the Coast Counties Company has been odorized, having a smell similar to that of manufactured gas and minimizing the danger of leaky pipes. The gas is piped to Coast Counties territory from the Kettleman Hills wells, in Kings County.

This new fuel has met with a great deal of enthusiasm throughout the entire territory of this company, special editions of the newspapers being published when natural gas came in, the editors commenting editorially on natural gas, it being considered the outstanding event of the year, in that cheap fuel will materially aid in the attracting of industries to these communities, as well as give the domestic consumer more value for his dollar.

The changeover from manufactured to straight natural gas has had a material bearing on the merchandise department. The first month's bills showed a reduction of 42 per cent, even though the first six or eight days were before the changeover. According to Pierre Vinet, new business man-

ager, this has had a tendency to not only increase the sale of appliances, but more are being sold for cash and a better quality of appliances is being purchased, as the consumers feel that they can afford more and better equipment, with the reduction in their price for fuel.

The changeover men filled out cards bearing complete information concerning the appliances in each home visited, and these have proven of valuable aid to the sales organization. In one district, a total of 906 premises with 1,572 appliances were adjusted. Of these, 110 were listed as worn out and this has given the salesman an excellent opening for a sale.

During the entire changeover special stress was given to the personal appearance and attitude of men in contacting customers, and it is gratifying to note that no complaints were received relative to men not being courteous and we have had many compliments on our service, as indicated by the accompanying letter.

It is also an interesting fact that this

(Continued on page 232)

A. G. A. Takes Part In A. S. M. E. Celebration

THE American Gas Association was well represented at the annual meeting and celebration of the fiftieth anniversary of the American Society of Mechanical Engineers, which took place in Washington, D. C., last month.

Delegates representing the A. G. A. were as follows:

Conrad N. Lauer, president, Philadelphia Gas Works, Philadelphia, Pa.; Ord Preston, president, Washington Gas Light Company, Washington, D. C., and John A. Clark, vice-president, Public Service Electric & Gas Co., Newark, N. J.

President Hoover was the principle speaker at the celebration. He received the first Hoover gold medal which the society will award annually hereafter, to commemorate the civic and humanitarian achievements of the President as an engineer.

The nation needs the engineer's approach to truth, said President Hoover to the 1,000 delegates in the Mayflower Hotel.

The problems of government have been complicated by the very mechanical advances which the engineer has made, said the President. These problems he called unsolvable without the technical knowledge of the engineer, without the fundamental engineer's approach to truth. Engineers permit themselves emotion "only in contemplation of their service to humanity," he continued, and they should exert themselves to aid in government because "our greatest difficulty in dealing with these problems of government is when the emotion comes first."

President Hoover said:

"I am glad to join with my fellow-members in this celebration of the fiftieth anniversary of the founding of the American Society of Mechanical Engineers. It would be a difficult task to measure the blessings brought by this association through the stimulation to invention, the improvement of methods, the adequate training of en-



Ord Preston



John A. Clark



Conrad N. Lauer

gineers and the advancement of knowledge in a large sense. During its span of life it has contributed a great part in the development of an art into a mighty profession upon whose capacity and fidelity rest so much of human progress.

"I feel especially honored that the association should, through the beneficence of Mr. Lauer, have established a new distinction among engineers, and should have designated me as its first recipient. The purpose of this medal is to mark the public service of men who have gone outside their strictly professional work to interest themselves in civic and humanitarian affairs. And the engineers have something to contribute to public service.

"With the development of our great national tools—our engines, our railways, our automobiles, our airplanes, our steamships, our electric power and a score of other great implements, together with the supplies of material upon which they depend—the engineer has added vastly to the problems of government, for government must see that the control of these tools and these materials is not misused to limit liberty and freedom, that they advance and do not retard equality of opportunity among all our citizens.

"These great discoveries and inventions have brought great blessings to humanity, but they have multiplied the problems of government, and the complexity of these problems progresses with the increase of our pop-

ulation. Every county government, every municipal government, every state government and the Federal government itself, is engaged in the constant attempt to solve a multitude of public relationships to these tools which the engineers by their genius and industry constantly force to the very doorstep of government.

"And in solving these problems we have need for a large leavening of the engineering knowledge and engineering attitude of mind and engineering method. These problems of public relation are unsolvable without the technical knowledge of the engineer. They are unsolvable without the fundamental engineers' approach to truth. That is, first to determine the facts, arrange these facts in proper perspective and then distill truth from them in the retort of experience.

"Engineers do not undertake to build these gigantic tools, whether bridges, power plants or railroads, without knowing the service they are to perform, without infinite patience in discovery of economic and scientific fact, without the adaptation of experience, without giving consideration to capacity in the human material available to conduct them, and without the final crystallization into positive constructive action. No emotion enters into these determinations. Emotion is permissible only in contemplation of their service to humanity.

"But when the problems which these

(Continued on page 214)

Rate List No. 8 Now Available to Members

RATE List No. 8 is now available. This publication of the American Gas Association is a carefully indexed, complete and authoritative compilation of rates charged for gas service by gas companies operating in the United States and its possessions, Canada, Cuba and New Foundland.

Rate List No. 8 contains a complete list of manufactured and natural gas companies showing communities served by each company, heating value of gas supplied and rates charged for all classes of gas service in each community.

Several new features in connection with the Rate List will be introduced this year. Supplements to the Rate List will be published at frequent intervals, showing:

1. Changes in present schedules of existing companies.
2. New special rate schedules established by existing companies.
3. New towns added to the systems of existing companies together with rate schedules applicable to this new territory.
4. Names of new gas companies beginning operations during the year together with communities served and rates charged for all classes of gas service.

In addition to these supplements an analysis of Rate List No. 8 will be published and distributed to purchasers of this publication. This analysis will show the number of rates of various forms in use on January 1, 1930, as compared with January 1, 1925. It will be similar in form to the article in the June 1928 issue of the A. G. A. MONTHLY entitled "Analysis of Manufactured Gas Rates" by Paul Ryan.

The general manager, sales manager, rate engineer, industrial sales engineer and househeating engineer of every gas company should have a copy of Rate List No. 8. The general sales manager and market analyst of every manufacturer and distributor of gas-burning equipment will find the Rate List useful.

The price of Rate List No. 8 is \$5 per copy to members of the American Gas Association. This charge includes the cost of the supplements to be issued during the year and the Rate List Analysis. **ORDER NOW—THE SUPPLY IS LIMITED.** Address orders to the American Gas Association, 420 Lexington Avenue, New York, N. Y.

Home Service Educational Courses

Educational courses for the benefit of gas company home service directors have been announced by the American Gas Association Laboratory, Cleveland, O., and Columbia University, New York City, the latter in cooperation with the Association.

The Laboratory course will take place June 16-21, under the direction of the laboratory staff. The course at Columbia will take place July 7-25 under the instruction of Professor C. J. Lynde and special lecturers. This will be the second course of its kind at Cleveland and the fourth at Columbia.

Announcements containing full information and details relative to these courses were sent last month by Alexander Forward, managing director of the American Gas Association, to those interested. Further data may be had upon request at Association Headquarters, 420 Lexington Avenue, New York City.

McCarter Awards

ADRIAN YOUNGLOVE, foreman of The Laclede Gas Light Company, St. Louis, Mo., has been awarded the McCarter medal for saving the life of Lawrence J. Kennedy, October 9, 1929.



Mr. Younglove

The McCarter medal is awarded by the American Gas Association to anyone who saves a life by the Schaffer prone pressure method of resuscitation.

Kennedy attempted to connect a gas range at the home of his daughter, Mrs. Katherine Landis, when he was overcome. Younglove applied the Schaffer method until the first-aid crew of the gas company arrived with an inhalator and revived the man.

The medal and certificate were presented to Younglove by Joseph T. Davis, president of the St. Louis Safety Council.

At an all-employee safety meeting, at Mattoon, Ill., Ira T. Koch, gas plant foreman of the Central Illinois Public Service Company, who had previously received a McCarter Medal for life-saving, was presented with the McCarter Bar and Certificate for saving the life of Melvin Voyles, a pipe-fitter, employed by the same company at Hillsboro, Ill. He had been overcome while on duty at Taylorsville, Ill.



Mr. Koch

N. J. Faulhaber, foreman of the Central Illinois Company, who assisted Koch in saving Voyles' life, was presented with a McCarter Certificate.

Andy Day, a fitter of The Laclede Gas Light Company, St. Louis, Mo., also received a McCarter Medal for resuscitating Edward Enloe, a laborer who had been overcome by gas while asleep at his home. This presentation was made by Joseph T. Davis, president of the St. Louis Safety Council.



Mr. Day

Hopkins Students Inspect Industrial Gas Installations

ON March 26 and 27 the Senior Gas Engineering Class of Johns Hopkins University, under leadership of Professor Lloyd Logan, were taken on an inspection trip of industrial gas applications in Baltimore, Md., to give them practical experience in relation to this important phase of the gas industry. This group was composed of the following:

Professor L. Logan, H. Ellerbrock, Stephen G. Moran, William Olsen, T. J. Dwyer, Henry F. Gibbs, M. A. Elliott, J. W. Carroll, J. A. Purcell, R. L. McAll and Geo. M. Glazier.

This inspection trip was made under the auspices of the Consolidated Gas Electric Light & Power Company of Baltimore and the men were escorted through the various plants by the following representatives of this Company:

Lawrence E. Biemiller, S. Procter Rodgers, John Borland and A. B. Williams.

The plant of the Eastern Rolling Mills Company was visited and some interesting industrial gas applications were seen. This company produces steel sheets particularly for the automobile trade, having a capacity of 10,000 tons per month. Bar steel is received from the steel mills and these bars are heated to a temperature such that they can be rolled into sheets. In connection with this heating there are five Surface Combustion "pack" furnaces in use, each with an average monthly gas consumption of about 3,000,000 cu.ft. The sheets from this furnace, after further rolling and shearing, are normalized in a long gas furnace, then pickled, rolled cold and annealed in box furnaces. The large furnace previously mentioned is called a normalizer. It is seventy-five feet long and the sheets are carried through the



Mr. Biemiller

By LAWRENCE E. BIEMILLER

Supervisor, Fuel Sales, Consolidated Gas Electric Light and Power Company of Baltimore

length thereof over water-cooled rollers and given the desired heat treatment, reaching the maximum temperature of about 1850. This furnace burns an average of about 50,000 cu.ft. of gas per hour. At this plant the gas compressor installation is of great interest as it has capacity of slightly over 100,000 cu.ft. of gas per hour, compressed to about 12 pounds. The metering is also of interest, since two rotary type and two large tin meters are used. In inspecting this plant the Hopkins students saw what was perhaps the greatest use of manufactured gas at one plant location in this country.

The Porcelain Enameling and Manufacturing Company of Baltimore is well-known in the enameling industry for its large production of high-quality enameled frit. This frit is produced in gas-fired smelters. The Hopkins students saw the smelters in operation, there being five rotary smelters, each using gas at the rate of 3,000 cu.ft. per hour and one stationary smelter using gas at the rate of about 6,000 cu.ft. per hour. This smelting operation takes place at a temperature of about 2100° F. and the resulting molten mass is poured into water and broken into small particles, which are ground to great fineness. Of special interest in this plant was a recent installation of rotary driers used to dry the frit. There were four such driers, each using a gas-heated air heater. The drier proper is a rotating cylinder with the screw arrangement on the inside to carry the frit through it. The frit is handled automatically on each end.

Then the plant of the Crown Cork and Seal Company was visited. Here the familiar "crown" so extensively used in connection with bottled liquids of all sorts is produced by the millions. Gas is used on seven or eight lacquer-

ing ovens varying in length from forty to 100 feet and ten lithographing ovens almost as long. These ovens are all heated by gas through the medium of external unit heaters. Such an arrangement gives the necessary flexibility, control and cleanliness. In addition to these larger uses about thirty feet of gas is used on each of several hundred assembly machines for the purpose of placing the cork disc in the tin plate crown, and also in connection with the processing of the cork. The compressor installation here consists of two 39,000-foot-per-hour compressors, one at present serving as a spare. The maximum hourly demand is 40,000 cubic feet and the monthly consumption 12,000,000.

Another type of industry was visited when the plant of Glidden Company was inspected. Here gas is used in rotary calciner for the final calcination of lithopone. This operation is done at a temperature of 2000° F. and it is essential that both correct temperature and atmosphere be maintained. There are two kilns at this plant, each equipped with a single high-pressure gas burner, one burning 3,000 cubic feet of gas per hour and the other burning 4,000 cubic feet of gas per hour. This is another example of 24-hour operation, and the monthly consumption approximates 5,000,000 cubic feet of gas from these two burners.

It was desirable for these budding gas engineers to inspect one of the older and largest users of industrial gas, that is, the baking industry. They inspected the plant of E. H. Koester Company, who use gas for baking bread, cake and crullers. The bread is baked in traveling ovens seven feet long, and about eight or ten feet wide. The cake is baked in brick or metal ovens with a revolving hearth, using gas at a pressure of one pound in connection with bar burners. Such miscellaneous heating as that necessary for the preparation of icing is also done with gas.

Industrial Business as Regards the Heavy Metallurgical Field*

IN the heavy metallurgical field, fuel has a greater bearing on the cost and quality of the finished product than in any other branch of manufacturing. Fuel, one might say, is the prime mover of the heavy metallurgical field; that is, in the field that deals with the smelting, melting, refining and shaping of metals. The common engineering metals all require large quantities of fuel of some kind, in their preparation for the ultimate consumer.

"The above does not mean that in all instances natural gas or any gaseous fuel can entirely replace other types of fuel. In many cases the fuel is not only a source of heat but is also a chemical reagent. In an iron or lead blast furnace, coke, coal or charcoal must be used. Electricity is the only medium which will separate aluminum from aluminum oxide.

In every branch of the heavy metallurgical field, however, there are many heating operations where natural gas is the ideal fuel and where, on a basis of equal final cost of product, it will always be given the preference. Where natural gas is available, a considerable lowering in production cost can often be effected, as a clean, concentrated fuel, always uniform in quality, and available on short notice, permits the construction of furnaces so designed as to fit into production lines with large savings in labor and fuel. The product leaving the furnace is more uniformly heated, scale is lessened, and the percentage of second grade work and rejections is decreased.

Most of us here today are from districts where the metallurgy of iron and steel is the outstanding division in the heavy metallurgical field. I will, therefore, confine myself largely to that division.

First and foremost in this division is the steel plant. Here fuel occupies, next to the steel itself, the position of greatest importance.

By KARL EMMERLING

East Ohio Gas Co., Cleveland, Ohio

In the open hearth plant, since its cost has risen to the present level, natural gas no longer is used to as large an extent as it was at one time. I am entertaining high hopes, however, that it will come back before many years go by. I am very sure that if the proper furnace construction and the proper method of application is once found, natural gas will again occupy a very prominent place in the open hearth plant. Some experiments are being made now which indicate that the use of about fifty per cent natural gas at high pressure in connection with fuel oil works very well, lowering both the B.t.u. required per ton and time per heat.

In the soaking pits, natural gas is an ideal fuel. Due to closer control of the air-fuel ratio, decrease in furnace repairs, and the elimination of producer operating costs and overhead, the operator will save money even if the cost of natural gas per million B.t.u. is fifteen or twenty per cent above the cost of producer gas.

In the rolling mills, where billets are heated in large continuous reheating furnaces, natural gas is very desirable. The steel is heated more uniformly, scale is less, and production is higher with gas than with oil or producer gas. Very often in rolling mills, furnaces are the neck of the bottle, that is, the mill has plenty of capacity to roll more steel if the heating furnaces are capable of furnishing it. If furnaces can be redesigned and equipped with first-class burners, production per furnace can often be increased, which, to the mill operator, sometimes means more than actual fuel cost.

In the foregoing three branches of steel plants, fuel, while it is all-important, does not have the effect on the final product that it has in some of the later operations. Furnaces at the present stage of their development can be

made just about as efficient with oil or producer gas as with natural gas, and as a rule, natural gas must be sold at a price which is not over 15 per cent higher per million B.t.u. than the total cost of other fuels. By total cost I mean cost in the furnace, which includes all such items as pumping, heating, gasification cost, cost of cleaning producer mains, furnace repairs chargeable to harsh, crude fuels, et cetera. There are some exceptions to the above, however. In the rolling of certain alloy steels, heating is a very exacting task. If such a steel is overheated, heated unevenly, or has been heated in such a manner as to cause excessive scale, the result is a high percentage of rejections, which cost much more than the apparently higher fuel cost resulting from the substitution of natural gas, but which would eliminate such rejections.

There are finishing operations in the steel plants where natural gas, I am glad to say, is rapidly coming into its own. The outstanding example of this is the sheet mill.

In recent years, the demand for sheet steel of a high quality has increased enormously, particularly for use in the automotive industry. Special alloys are common. Sheet steel used in the cold deep drawing process, which is most commonly used in forming the various parts of an automobile body, must be heat treated very accurately. Sheets which are made for use in automobile bodies must have perfect surfaces, as any imperfection in the surface is magnified when the body is painted. Where this perfection is required, scaling, of course, must be eliminated entirely. That is why natural gas is such a common fuel in the sheet mill.

Normalizing was the first operation in the sheet mill where gas found favor over other fuels. This heat treatment was developed in order that the sheets would stand the deep drawing operation just mentioned. Continuous normalizing furnaces, natural gas-fired,

*This paper was presented at the First Natural Gas Regional Sales Conference at Pittsburgh in February.

have been in common use for the last four or five years, and are being improved constantly. The recent adoption of the walking-beam method of conveying the sheets through the furnace has eliminated two very objectionable features. First, the scratching of the under side of the sheet by the disc conveyors commonly used in the older furnaces. This makes the use of a waster sheet unnecessary and thus reduces the fuel cost and increases the production. Second, the water-cooled shafts ordinarily used on these disc conveyors are eliminated and about 20 per cent of the heat required in normalizing is saved.

In the last year or so, walking-beam type conveyor furnaces, automatically controlled, have been introduced into the sheet mills for heating sheet bars and sheet packs. These furnaces have eliminated a large portion of the labor required in handling the material, decreased the fuel cost, improved the surface of the sheet, and increased the production to such an extent that in many cases the entire sheet mill is being rearranged to make the use of such furnaces possible. I believe that the outstanding development in the last year, in the use of gas in the heavy metallurgical field, has been the continuous furnace for heating sheet packs and sheet bar. The use of these furnaces should increase the gas load in sheet mills immensely.

As the need for accurately heat-treated sheets increases, I believe that box annealing in the sheet mill will be done more and more with natural gas. To date, the box annealing that has been done with natural gas has been done in furnaces converted from another fuel, with results that have not been entirely satisfactory. Recently, I understand, there has been some development in natural gas-fired box annealing that looks very promising.

Deoxidizing of sheet steel during and after box annealing is an operation where natural gas is used whenever available, due to its freedom from sulphur, oxygen, moisture, and other constituents that interfere with perfect deoxidation. In this process, natural gas is often used where coke oven gas is to be had at a nominal cost. This load, while not large, is a desirable one.

In the other finishing operations in

steel mills, such as rolling of strip, wire drawing, rolling of seamless tubing, the rolling of small section rod and coil, natural gas is finding a wider use for practically all the heating operations. The need for close temperature control, fine surface, absence of scale and exact heat treatment has made a refined fuel a necessity, and natural gas meets all the requirements better than any other fuel in use today.

While the steel plant furnishes a market for a very large percentage of the natural gas sold in the district that most of us present today are from, we must not overlook the other branches of the iron and steel industry.

The malleable iron and steel foundries can be developed into good consumers of natural gas. Practically all malleable iron and steel castings must be annealed, either in periodic or continuous furnaces. This annealing can be done with natural gas costing considerably more per million B.t.u. than the cruder fuels, as the cycle of operation can be shortened, due to more uniform heating. The life of the annealing pots is lengthened, and, in the case of steel castings that are annealed in the open, the amount of scale is decreased.

All large foundries have core ovens. Core drying should be the first operation in any foundry to be turned over to gas, as here the savings in heat required, in spoiled cores and in time, far off-set the apparently lower cost of other fuels.

Forge shops are large potential users of natural gas, both for the heating of the stock to be forged and for the heat treating of the finished forgings. The use of continuous furnaces for heat treating is becoming common in the forge shops, and natural gas is the ideal fuel for this heat treating.

What has been said about sheet mills, foundries, and forge shops could be repeated over and over with regard to other phases of the iron and steel industries, bolt and nut plants, rivet plants, spring plants, automobile bumper plants, et cetera. They all use heat and have more or less the same heating problems. Natural gas when used in the right manner will, in many cases, solve these problems in the cheapest and most effective way.

In the other branches of the heavy

metallurgical field, there are numberless uses for natural gas.

The lead refiners can use it in place of oil and coal for the refining of crude lead, in smelting and refining of scrap lead and lead drosses and in alloying. Where this refining and alloying is done in large metal pots, natural gas, properly used, is the cheapest and most desirable of all fuels.

Zinc refiners can use natural gas in the regenerative retort blocks ordinarily fired with producer gas in roasting furnaces, sintering machines, and other heating operations connected with the smelting of zinc. Zinc oxide can be made with natural gas as a fuel at costs lower than those obtained with fuel oil, on account of longer retort life and higher production.

The aluminum industry has use for large amounts of natural gas, both in the calcining operation necessary in the preparation of aluminum oxide before it can be separated electrically into metallic aluminum, and also in the refining of scrap, melting and alloying of aluminum for foundry work, and in aluminum forging.

The manufacture of red lead, litharge and other lead oxides is an exacting process, and the close control afforded by natural gas makes it a fuel of outstanding value in this field.

It would be possible to go on almost indefinitely on Industrial Business as regards the heavy metallurgical field, as its possibilities are almost endless where natural gas is available at prices which are at all compatible with the true prices of other fuels. The heavy metallurgical field has use for natural gas in larger quantities than any other group of industries, offers better load factors than any other field as most of its operations are continuous, but due to the fact that in many instances other fuels can be applied with efficiencies almost as great as those obtained from natural gas, the price for which natural gas can be sold is less than that in the finer heating operations of the light metallurgical field, where quantities of gas needed are less and operations more intermittent, but where the savings are greater.

I would like to say a few words on the conversion of furnaces fired with other fuel to natural gas. There is no question that the best possible results

(Continued on page 233)

World Engineering Congress in Japan



Mr. Norcross

THE world engineering congress in Japan, which took place last Fall, was promoted by the Japanese Government with the avowed purpose of diffusion and interchange of knowledge on scientific and engineering subjects and upon various phases of professional work, to promote international cooperation in the study and application of engineering science, and to cultivate a feeling of good fellowship among engineers of the world. While Japan and other nations might derive much benefit in these ways, Japanese engineers and statesmen freely stated, however, that the greatest value which they attached to the Congress and the highest good which they hoped would result, was a better understanding of Japan and the Japanese by the visiting engineers and the dissemination of this understanding among the peoples of the earth. These hopes were evidently especially directed towards America.

The impression gradually made upon me as to their feelings towards us was of a high admiration for our character, ability and progress, a deep and an abiding sense of appreciation and gratitude for everything of a constructive nature which has come from us.

The Congress had the hearty endorsement of President Hoover who received the special trainload of European and American delegates at Washington. The Japanese Ambassador at Washington entertained the party at a banquet which at the time impressed us deeply but later proved to be but a beginning for a series of remarkable

By J. ARNOLD NORCROSS American Gas Association Delegate to International Meeting at Tokyo

attentions and impressive entertainments. The Japanese Parliament appropriated a generous sum towards the expenses of the Congress, as did the larger firms interested in the industrial development of Japan and in the various subjects to come before the meeting.

The visiting delegates were astonished at the vast amount of research work in progress in Japan and carried on by Japanese. Every government department has a laboratory devoted to its own business. Besides these, the government maintains a great central research laboratory called the Rikagaku Kenyusho (Physical and Chemical Research) and every effort is made to industrialize the results obtained. Nearly every prefectural government and large city has its own experimental station and laboratory for the advancement of those industries on which the people of the district depend. Then, too, private research laboratories, well equipped and with efficient personnel, are maintained by all of the big business firms.

It is to be noted with regret that the gas industry was almost absent from the proceedings. There were papers on low carbonization, synthetic oil, and coke, but these were treated only from the standpoint of fuel and power. There were papers also on tar, ammonia, and effluents from gas works and coke ovens; but these too were only incidentally connected with the gas business. There was a paper on

A. G. A. Representative Reports that Nation is Industrializing — Describes Use of Gas.

the Woodall Duckham Vertical Retort system, an example of which is now building in the new gas works in Tokyo. Neither was there any consideration of the applications of gas or of gas appliances. Beside your delegate there was but one overseas representative of the gas industry at the Congress.

It should be said, however, that The Imperial Gas Association of Japan held a meeting in Tokyo during the Congress, one whole afternoon being devoted principally to two addresses, one by Walter T. Dunn, consulting gas engineer of London, and one by your delegate. There were about four hundred Japanese gas men present, most of whom understood English and many of whom spoke it to a useful extent.

Gas was introduced into Yokohama as a city project in 1872 and in Tokyo as a private undertaking in 1874, and in Osaka, Kobe, Nagoya and Kyoto between 1897 and 1908. These with Tokyo are the largest cities in Japan, Tokyo and Osaka having two and one-quarter millions of inhabitants each. Both Osaka and Kyoto pay 5 per cent of their net to the city. Gas replaced petroleum for house lighting, but was never used for street lighting. It was never in general use as in those countries where it antedated electricity by many years.

The proportion of the houses supplied with gas is for

Tokyo56%
Osaka51%
Nagoya33%
Yokohama30%

The progress of the business has been slow though greatly accelerated in the last ten years.

To understand the situation a few general considerations must be in mind:

Japan proper is fundamentally an agricultural country with a population of sixty millions, increasing at the rate of three-fourths million a year. But only 17 per cent of her area is arable. The great problem is to feed her people. The growing population cannot go elsewhere and the solution, therefore, would seem to be to transform the nation into an industrial one. To this end her best brains, her energy and her wealth are devoted. A merchant marine is being built up which in tonnage and quality is second to none.

The cities spread over an immense area because the houses are almost entirely of one or two stories. They are of flimsy wood construction, with tile roofs, no cellars, windows of paper and often the front and sides are closed by sliding panels with paper panes where we would expect glass. There are no chimneys in most of them, the cooking and heating being done ordinarily in the open room over small charcoal fires contained in porcelain or fire brick vessels filled with sand with a hollow in the center for the tiny burning mass of charcoal or sometimes wood or peat.

While the principal cities do not have the cold winters of our Northern States, they have a number of months of raw winds, clouds, rain and some snow. The wind blows strongly through the houses and there is great need for better heating of the homes. Only a very hardy race could stand the winter living conditions. In my travels I saw a few gas room heaters in the European parts of hotels and inns, but the little charcoal burners were the usual thing. Even the leading department stores, which are modern in every other way, had porcelain charcoal pots as the only means of heating. There is therefore a great opening for gas heating, but the people are very poor and have never known anything different so the introduction of gas heating of the homes must be a slow process dependent largely upon improvement in living standards which is in turn probably dependent upon industrial development and a corresponding gain in foreign sales.

Gas for cooking is fairly established

and progress is shown in sales of gas water heaters. There are no people so addicted to the hot bath as are the Japanese so the potential business is limitless. The use of the gas water heater is therefore only a question of having the price, and a steady effort at education. The latter is in progress, but the money to buy and to use will come very slowly.

The use of gas in the industries is growing. The industries themselves are being rapidly promoted and are gradually becoming stronger and more prosperous. This promises to be the most easily attainable large increase in the gas business. The theory of development rates is understood and their possibilities are recognized, but there is hesitation in applying them. When this is overcome the gas business in Japan will make rapid strides.

Gas operated refrigerators are in use and their sale is being pushed. This business has excellent prospects because of the long, hot summers.

The Japanese now own, I believe, all of their gas companies. They are strictly regulated by governmental authority as to capitalization, profits and other matters. The maximum dividend allowed is 12 per cent on actual investment. The Tokyo Company was recently refused permission to increase its capital from ¥100,000,000 to ¥150,000,000 in order to capitalize its construction cost for the preceding few years and provide money to complete construction which is now in sight. The service had been greatly extended by adding about 100,000 meters within the preceding two years. Besides this, large sums had been spent on new holders and improvements to existing works, and a new gas works partly completed of a capacity of twenty millions of cubic feet per day. The excuse was protection of the people against the burden of over-capitalization; but the occasion was seized upon by politicians to capitalize themselves and they hoped and endeavored to force the company to reduce the rates by holding them up in their need for capital.

The average consumption of gas per year per meter was 17,370 cu.ft. in 1926 compared with 9,778 cu.ft. in 1912. The maximum for 1926 was in Tokyo by the private company—25,462, while the minimum was in Yo-

kohama—a municipal undertaking—12,000 cu.ft. In Tokyo a very large number of new customers have been added of late, but the sales per meter are no longer more than in 1926. This experience is general as shown by the figures for the whole country for the period 1912 to 1929 during which:

Gas mains increased (to 520 miles) by 44 per cent.

Gas meters increased (to 854,000) by 73 per cent.

Gas sales increased (to 17 billions) by 42 per cent.

A letter has, however, just come from the president of the Tokyo Gas Company which says that they have experienced a gain in gas sales of 30 per cent in 1929. While this is not to be expected again, he looks forward to at least 10 per cent gain in 1930. No mention was made as to the financial results, but I know that the Tokyo company, and the other companies, are very prosperous and their shares sell high in the home stock market.

With the very small monthly sales per meter it is hard to see how this can be. The price of gas varies greatly from place to place but the range is from \$1 to \$2 per M cu.ft. The price in Tokyo is 8.7 sen per m.³ or roughly \$1 per 1000 cu.ft. and the average monthly bill in 1928 was about \$1.60. The cost of construction is not very different from ours, coal costs more and oil about the same. The difference must be explained by the lower heating standard, (e.g. 400 B.t.u. for Tokyo and 350 for Yokohama) and the lower wage rates paid in all departments—roughly one-half of ours.

Unaccounted-for gas in Tokyo and Yokohama was 35 per cent for the year following the earthquake. This has been reduced to 10 per cent in Tokyo and in general runs from 6 to 10 per cent.

Judging from visits to two gas works—Tokyo and Yokohama—and conversations as to other works, the means and methods of manufacture are up to date.

The usual thing was some form of coal gas apparatus plus a water gas plant. In the Tokyo works, there were Koppers ovens from Germany, Woodall Duckham Verticals from England, and Humphreys and Glasgow and U. G. I. Water Gas Plants. These had

been fitted with revolving grates by "Bamag" of Germany. There was a Claus process for nitrates, a waterless gas holder and waste heat boilers. There is also a process they called "soda water purification" for H_2S . This appeared to be the same as that of the American Koppers Company. While there are installations for mechanical handling of materials, man power is used in ways that look wasteful to us. For example, the meter setting and complaint wagons are propelled by the men who attend them. This apparent neglect of opportunities for labor saving in the face of knowledge of ways and means is due to the fact that often the cost of manual labor is less than the cost of machine operation when investment, depreciation and upkeep are included. Then too the great problem of employment for the growing population makes them lean towards retention of manual methods and a possible extravagance in that particular.

A development in which they are ahead of us is the use of complete gasification plants. In the Ormur-Tokyo Works is a Strache complete gasification plant built by "Bamag," in use about five years and still giving complete satisfaction. It consists of two sets of one million cu.ft. daily capacity each with generator carburetter, superheater, rotary automatic grates, and waste-heat boilers. Non-coking Hokaido high volatile coal is used leaving 12 per cent of ash. The gas in the coal is driven off by the heat of the blue gas passing through it, and the heat of the blast working upon the lower part of the column of coal. The gas made is of 380 B.t.u. which is 20 B.t.u. below standard.

The new Tokyo gas works, now nearing completion, consists of a Woodall-Duckham plant, from England, coke ovens by a Japanese concern, and a Kreisa Continuous Complete Gasification plant built by a French firm. This consists of a Kerperley Producer surmounted by a conical chamber into which gas coal is charged, a carburetter, a superheater, and a waste heat boiler. The blast goes up through the producer and out just below the column of coal, thence down through the carburetter and up through the superheater and waste heat boiler. The back run principle

is utilized and the steam enters the top of the superheater, passes down through it, up through the carburetter and into the base of the producer. The blue gas formed passes up through the gas coal driving off the coal gas with it. The carburetter is fitted with oil sprays.

In the Yokohama Gas Works is a "semi-complete gasification" plant built by the Power Gas Corporation of London. This consists primarily of a high chamber, the lower end being fitted with a coke extractor something like that on the bottom of a Woodall-Duckham retort. The lower half of the chamber is a generator, the upper half a truncated cone filled with gas coal. The coal chamber is surrounded by an annular space through which the blast gases pass on their way from the generator, thus furnishing heat to gasify the coal. The remaining heat of the blast is absorbed in waste-heat boilers. The blue gas made in the coke in the generator passes through the gas coal and at the top. There are five of these sets which have been in operation three years—one set is spare most of the time, the four sets making two millions a day which is all they need. The coal used is 30 per cent Hokaido coking and 70 per cent Fusan (Manchuria) non-coking coal. Of this mixture about 30 per cent is delivered as coke at the bottom of the set. The heating standard is ap-

proximately 340 B.t.u. (3000 Cals.)

The disposal of small coke is a hard problem and this accounts for the adoption of complete or semi-complete gasification plants. Though charcoal sells for \$50 a ton and coke for about one-fifth that price it is nearly impossible to substitute coke for charcoal owing to the primitive appliances for cooking and heating. Efforts have been made to make a smokeless fuel which would kindle and burn like charcoal by briquetting a mixture of coke, molasses and bamboo cane, and in other ways; but as yet with no success. Large coke for industrial use is made in by-product ovens of a mixture of high and low volatile coals as with us; but in one gas works at least, Chinese anthracite is mixed in to give more strength to the coke structure.

These notes on the gas industry would be incomplete if I failed to mention that there is in the Tokyo Gas Works an attractive enclosure with a lovely garden, the entrance and central path being framed in by torii—typical of all Japanese temple entrances. At the head of the central path is a little temple dedicated to William Murdock, the discoverer of gas. They revere his memory, are grateful for what he did, and twice a year hold solemn services at this temple in commemoration of his achievements for the benefit of mankind.

A Few Copies of the Gas Chemists Handbook Still Available

WHILE the demand for it has been heavy, a few copies of the Gas Chemists Handbook still are available. This new edition was revised under the capable direction of a Technical Section Committee headed by A. F. Kunberger.

This work, which contains 800 pages, is profusely illustrated and is the latest word in books of its kind. The available supply is limited and it likely soon will be exhausted. Those who would like to add this volume to their library are urged to place their order for it without delay. The price is \$7.00 a copy. Orders should be sent directly to the American Gas Association, 420 Lexington Avenue, New York, N. Y.

Selling Gas-Fired Water Heating in Brooklyn

By Frank D. Tansey

Assistant Manager, New Business
Department, The Brooklyn Union
Gas Company



Mr. Tansey

THE fact that gas sales were developing a peak load during the autumn, winter and spring months and were shrinking into a valley during the ensuing summer led to a full realization of the importance of the water-heating load. Stress has been placed on this load only in recent years, although its desirability has always been recognized. Considerable study of the problem has been made by The Brooklyn Union Gas Company in its endeavors to build up the summer slump. Realizing that an increase in the water-heating load could be obtained through the sales of gas-fired water heaters for auxiliary work in displacing the water heater load that is absorbed in the fall



At the left is an attractive window display of a variety of hot water heaters. Below is a piece of newspaper copy making an appeal to mothers to use instant hot water.



A Masculine Appeal

and winter by coal fire heating systems, our company commenced organizing a definite campaign to this end.

Prior to studying the question and realizing the answer, our company had sold very few gas automatic and storage water heaters. The form of selling had been through the company or

sometimes by a plumber. However, this form of service was not extensively pushed.

Study of these conditions brought the realization that creation of a special water heater

A Mother's Friend - Instant Hot Water

Children like to play and they derive great benefit from it, but in playing they soil themselves and their clothes. Then is the time instant hot water service provided by the gas automatic storage heater is Mother's friend.

If you buy your heater now, you will receive:

1. Liberal Allowance for your old water heater.
2. Free—Remitted Bath Set.
3. 20% Discount from the price of any other domestic gas appliance bought from us within one year.
4. Ever Ready Supply of Hot Water.

May be purchased on convenient terms

Telephone: TRIangle 7900
The Brooklyn Union Gas Company

Mod This Coupon Today

The Brooklyn Union Gas Company,
New Business Department,
30 Nassau Street,
Brooklyn, New York.

Without obligation to me, please furnish particulars regarding instant hot water service.

Name _____
Street _____
City _____

division in this company was necessary. The plans were approved on May 17, 1929, and the division began work on June 3, with the following organization:

Supervisor in charge, stenographer and clerk, seven retail salesmen, three wholesale salesmen—selling the trades and builders—and one commercial sales engineer—selling large-volume installations and commercial installations.

One of the first steps taken by this division was establishment of friendly relations between plumbers and the gas company. This relationship is essential since in New York City water heaters must be connected by plumbers. Thus it is obvious that plumbers should be interested in the sale of water heaters. To this purpose we made arrangements by which the gas company supplied plumbers with water heaters which they sell.

Establishment of friendly relations was followed by a campaign of converting the plumber from the tank water heater to the storage type heater. We undertook this together with the allied campaign of showing plumbers the evil of endeavoring to promote the cheap type heater. This latter heater resulted in high gas bills with the result that coal stoves were installed to the injury of the gas industry.

To make our campaign constructive we recommended only the best type heaters. Although there are many makes of excellent heaters, we decided that it would be to the advantage of the industry and the company to restrict our line of water heaters. This, we deemed especially necessary at the beginning of our sales efforts. Accordingly the lines of two manufacturers were chosen. Better results could be obtained by specialization of types of heaters as made by these two manufacturers than by having half a dozen manufacturers' heaters displayed on our floors, causing indecision on the part of customers and sales people. The selection was governed to some extent by our judgment of the qualification of the manufacturers to produce a sufficient number to meet any demand on stock. Stress was placed in our sales efforts on the automatic storage type heater.

The sales policy adopted called for the selling of storage water heaters

and automatic heaters on an eighteen-month payment plan. These heaters are sold only when flue connections can be installed. The connections are made under agreement by our company's plumber representations. The charges are included in the sales price and are collected by the company from the customer either in cash or installments. The plumbers are paid connection charges monthly by the company.

Several sales incentives were decided upon at the outset. One of these, however, was discarded on December 31, 1929, since we found that through it we entered into competition with our dealers. The existing sales incentives follow:

1. With each purchase of an automatic water heater is given a free set of bath towels, wash cloths and a bath mat. This costs the company approximately \$5.

2. Each employee of the company who turns in a prospect, not on record in our prospect files, which results in a retail sale within 60 days, is paid a premium of \$5 for each automatic heater sold. In the case of a wholesale sale the premium is \$1 per heater.

3. Indexers, collectors and shop fitters are provided small survey cards whereon they record the status of each customer's premises they visit. These cards are used in our soliciting and are considered as a prospect card to the credit of the employee turning it in.

4. All automatic and storage water heater prospects are referred to the water heater division for closing.

5. An allowance of \$10 from the selling price of an automatic water heater is allowed for replacing a tank water heater or a furnace coil and an allowance of \$15 for replacing an automatic water heater.

Retail salesmen receive 10 per cent commission on the cash selling price, \$2 daily service credit, capacity premiums and drawing against earnings.

Wholesale salesmen have drawing accounts against earnings and receive capacity premiums.

Commercial salesmen work under the same system as retail men, save they receive \$4 daily service credit.

The capacity premiums schedule is:

First 1,000 gallons per year—\$1 per 10 gallons.

Second 1,000 gallons per year—\$2 per 10 gallons.

Third 1,000 gallons per year—\$3 per 10 gallons.

Fourth 1,000 gallons per year—\$4 per 10 gallons.

Each 1,000 gallons per year above 4,000 gallons—\$5 per 10 gallons.

Our campaign in the district served by The Brooklyn Union Gas Company

has brought splendid results. From June 3, 1929, to February 3, 1930, a period of eight months, we sold 1,908 gas-fired water heaters. A better idea of the success achieved by the division is attained when it is learned that our average yearly sales of storage heaters, during the time we sold all types of heaters unconnected, had been 125. We also exceeded the stiff quota assigned to the division at the inception of its work. At that time, despite the great decline the company had experience in water heater sales, each retail salesman was allotted a quota of 150 sales per year or three a week and wholesale men were given quotas of 500 per year. The commercial sales engineer's task is eighty jobs annually, of which he has sold seventy volume and commercial jobs.

The character of these installations is attested by the following few diversified units:

	Annually
Burns Bros. Coal Co.	2,400,000 cu.ft.
Brooklyn Daily Eagle	1,000,000 cu.ft.
Loew's Pitkin Ave. Theatre	600,000 cu.ft.
Motor Mileage Corp.	790,000 cu.ft.
J. G. McCrory Dept. Store	500,000 cu.ft.

The yearly quota of the retail division, according to the above outline, is 1,050 water heaters. For the eight months ending February 3, last, the retail salesmen sold 617 heaters, one man selling 137 water heaters. In the wholesale section of the water heater division greater results were obtained. Here 1,221 water heaters were sold in eight months, although the annual quota is only 1,200. In other words the annual quota has already been exceeded by 21 storage water heaters.

The success attained by this division in The Brooklyn Union Gas Company justifies the separation of water heater salesmen from other sales branches of the company. The specialization required calls for men who are trained in the mechanical operation, physical installation, maintenance cost and hot water utilization for various purposes. I believe that the results thus far attained are but a step toward the desired goal. We expect to surpass by far the quota assigned us for our initial year and to carry on the work of striving to level the inequalities of seasonal demand, thereby causing a readjustment of the former graph which showed a summer valley.



Professor Alfred H. White, Head of the Department of Chemical Engineering, University of Michigan

THE gas engineer is a comparatively new individual in the old field of engineering. Thirty years ago the gas plants of this country were operated by men who had gained their skill and knowledge through practical experience. These men were the first to realize that this method of training was too slow and tedious to meet the requirements of a growing industry. The necessity for efficiently trained young men to study the problems of the gas industry, and to design and operate gas making apparatus, required the development of a new mode of training.

This need was recognized by the University of Michigan with the establishment of the Department of Chemical Engineering in 1898. By 1900 this department, through its active head, Professor Alfred H. White, was able to interest the Michigan Gas Association in the establishment of a Research Fellowship to study the problems of the gas industry. Through this Research Fellowship which has been maintained continuously since its establishment, and which was the first example of collective research initiated by the gas or any other industry in the United States, Professor White and the Department of Chemical En-

Gas Engineering

At the University

By E. S. Pettyjohn

Assistant Professor of Gas Engineering,
Department of Chemical Engineering,
University of Michigan

gineering have been directly in contact with the needs and problems of the gas industry for thirty years.

The student in Gas Engineering at the University of Michigan is first required to obtain a working knowledge of mathematics, physics, and chemistry, which he then uses in his study of the basic unit operations. He also obtains a working knowledge of engineering mechanics, the elements of mechanical and electrical engineering and of modern languages and English. The complete list of subjects is presented in the new bulletin just issued by the Department of Chemical Engineering. Of the Chemical Engineering courses offered, the following are some which are directly applicable to gas engineering:

- Engineering materials.
- Fuels and furnaces.
- Structure and properties of metals.
- Chemical technology of the inorganic industries.
- Chemical technology of the organic industries.
- Unit operations.
- Chemical engineering thermodynamics.
- Fluid flow, heat flow, evaporation and filtration.
- Manufactured gas. An advanced study of the production of coal gas, producer gas, and carburetted water gas.
- Furnace design and construction. A study and application of the principles of furnace design; the properties of refractory materials; and their use in furnace construction.
- Pyrometry and furnace control.
- Heat and material balances.

Gas. Research relating to the manufacture, properties, and uses of coal gas, water gas, oil gas, and producer gas.

To coordinate his knowledge of Chemical Engineering, the student is required to present a thesis, based on individual research into a problem in the particular field of chemical engineering in which he is interested. He plans the experimental work, designs his apparatus, and, in general, acquires the technique of research. These undergraduate problems often have developed into graduate research projects.

These required problems, with their stimulus to graduate research, have resulted in a complementary development in laboratory facilities. The Department of Chemical Engineering now occupies 128,000 sq.ft. of floor space in the new East Engineering Building. The building provides general laboratories for crystallization, filtration, gas manufacture and utilization, metallurgy, oil, paper, paints, varnishes and pyrometry, and many single laboratory units for individual research problems. These facilities, with the personnel available, have resulted in the location at the University of Michigan, through the Department of Engineering Research, of many research projects dealing specifically with the manufacture and utilization of manufactured gas.

The research projects which at present are being conducted through the Department of Engineering Research at the University of Michigan include a study of the utilization of bituminous coal in the manufacture of carburetted water gas. This research project is an outgrowth of the Fellowship in Gas Research sponsored by the Michigan Gas Association, which was established in 1900. For the progress of this work, the Marysville Gas Plant of the Detroit Edison Company has been made available. The use of this plant offers the student in gas engineering an opportunity to study the fundamentals of plant operation and of

of Michigan

plant management. Three of five projects on the utilization of manufactured gas are sponsored by the Committee of Industrial Gas Research of the American Gas Association. They are investigations into the "Influence of Furnace Atmospheres on the Surface Decarburization of Steel," "The Heating and Burning of Steel in Forging Temperatures," and "The Use of Gas in Core Baking." Two projects are maintained by the Utilities Research Commission, and are investigations to "Determine the Effect of the Composition of the Gas Used for Heating Upon the Shrinkage of Metals in the Brass Industry" and on "The Permeability of Metal Retorts to Various Gases and Gaseous Products of Combustion at Elevated Temperatures."

The Department of Chemical Engineering has further extended the facilities offered for training students in gas engineering by developing, with the Detroit City Gas Company and the Consumers Power Company, a five-year cooperative course in gas engineering. The program provides for a preliminary employment period of eight weeks in the summer following the freshman year and two employment periods of seven months each, starting at the end of the second year and in the middle of the fourth year. There are six vacation periods of two weeks each, two in the first year, one in the second, two in the third, and one in the fourth to be used at the discretion of the student enrolled. Students in the Engineering College are given the opportunity to learn the details of the cooperative program during the freshman year. Those who are interested and who are accepted are employed by one of the companies for the preliminary period of eight weeks. At the end of this preliminary period, the students who have made a satisfactory record and are still interested are formally called upon to enroll in the cooperative course. The student who enrolls continues his second year of study in the Department of Chemi-



East Engineering Building, University of Michigan

cal Engineering without interruption. He is employed by the company with which he has established relations for the seven months' practice period beginning in July and ending the following February. The student then returns to the University and remains in residence for twelve months' study, which includes two semesters and a summer school. The following February he is re-employed for the second practice period of seven months until September 1 and then returns to the University for two semesters of study, graduating the following June.

The companies agree to give the student a somewhat varied employment which will put him in direct contact with the various aspects of gas manufacture, distribution and to pay him at the prevailing rate paid other workmen for the same type of work, but not less than 50 cents per hour. The company also retains the same right to transfer, discharge or alter the rate of pay of student employees as it does over its regular employees. The schedule is presented in diagrammatic form in the accompanying sketch.

The Cooperative Course was first offered last year and has aroused sufficient interest to warrant its continuance. The advantages which it possesses for obtaining first-hand knowledge of the gas industry should be of great assistance to the student in Gas Engineering, and enhance his worth to the industry upon the completion of his education.

Following is a list of the holders of the Michigan Gas Association Fellowship in Gas Engineering at the

University of Michigan, and their present positions:

Herman Russell, President of the Rochester Gas and Electric Co., Rochester, N. Y.

Alva F. Traver, Consulting Engineer, American Commonwealth Power Corp., 120 Broadway, New York, N. Y.

M. E. Mueller, Utilities Power and Light Corp., 327 S. LaSalle St., Chicago, Ill.

Samuel Ball, District Manager, Consumers Power Co., Bay City, Mich.

David H. Clary, Chemical Engineer, Pittsburg Coal Co., Minneapolis, Minn.

Joel M. Barnes, Barnes Textile Service Co., Boston, Mass.

John H. Wyman, Detroit City Gas Co., Detroit, Mich.

Wm. A. Dunkley, Superintendent Gas Department, Memphis Power and Light Co., Memphis, Tenn.

B. M. Ferguson, Sales Engineer, Graver Corp., 208 S. LaSalle St., Chicago, Ill.

R. S. Tour, Professor of Chemical Engineering, University of Cincinnati, Cincinnati, Ohio.

J. W. Hacker, Dyer Engineers, Inc., 1984 Trust Bldg., Cleveland, Ohio.

R. H. Tennant, Assistant Secretary and Treasurer, Clark Iron Co., Duluth, Minn.

C. K. Wirth, Manager, Missouri Industrial Gas Co., St. Louis, Mo.

Homer T. Hood, Industrial Engineer, Natural Gas and Electric Co., Battle Creek, Mich.

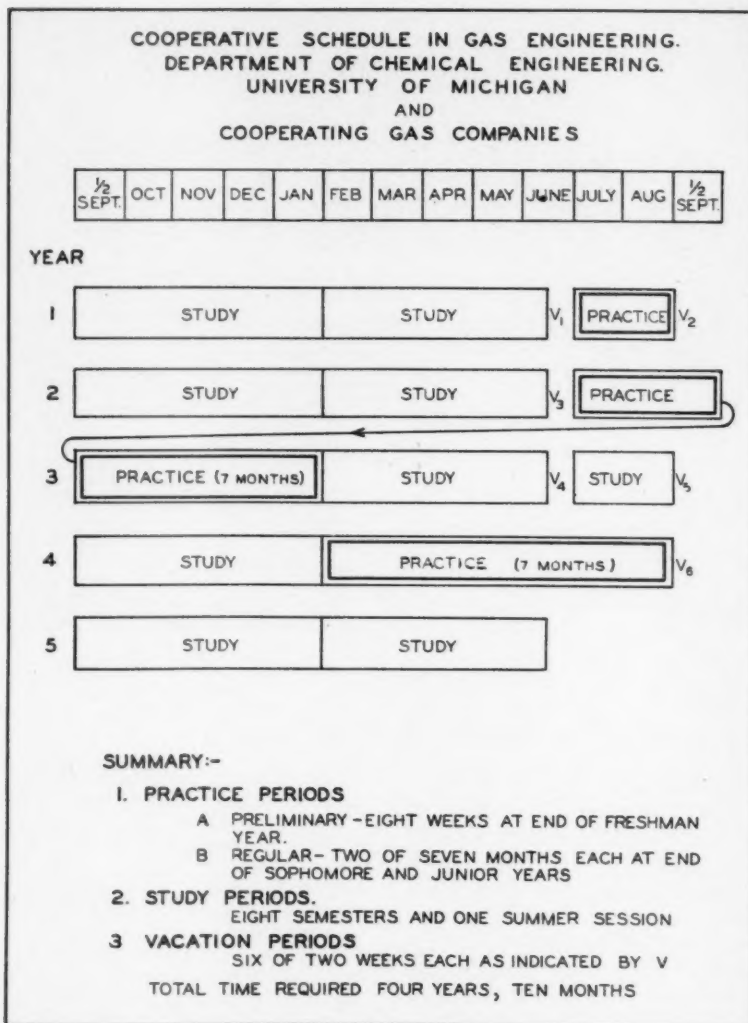
John T. Naylon, Division Manager, Oklahoma City Gas and Electric Co., El Reno, Okla.

Bert A. Standerline, Assistant Superintendent Coke Plant, Wisconsin Steel Co., South Chicago, Ill.

H. O. Andrew, Editor, *Gas Age-Record*, New York City.

F. C. Binnall, Standard Sanitary Manufacturing Co., Pittsburgh, Pa.

D. E. Herringshaw, Assistant Gas Engineer, Stevens and Wood, Inc., Jackson, Mich.



Cooperative Schedule in Gas Engineering

W. G. Chamberlain, Kelvinator Corp., Detroit, Mich.

R. E. Townsend, Consumers Power Company, Jackson, Mich.

H. W. Jackman, Engineer, Battle Creek Gas Co., Battle Creek, Mich.

F. C. Binnall, Managing Director, Deutsche Standard G.m.b.H. für Sanitäre Anlagen, Neuss am Rhein, Germany.

C. A. Breitung, State Manager, Southwest Utilities Co., Ada, Okla.

A. G. A. Takes Part in A. S. M. E. Celebration

(Continued from page 202)

great tools create come to the door of government they are at once emotional problems, for the resolution of our people, for equality of opportunity, for freedom from domination, for maintenance of initiative and liberty of action, arise from the deepest of human emotions. Yet if we would find

solution for these problems, if we would deal with them constructively, we must traverse the same hard road in determining the service we wish to perform, and with infinite patience in discovering the economic and scientific facts, with careful adaptation of experience, with high regard for the human material available to conduct our administration, and with positive action in administration.

"Our greatest difficulty in dealing with these problems of government is when the emotion comes first. Facts and the technical knowledge come but slowly or are often lost in a sea of embittered controversy. It is for all these reasons that the engineers with their training, their attitude of mind and their method, can contribute to the solution of the problems which arise from their own creations.

"I am not advocating that all public services be turned over to engineers. I have a high appreciation of the contribution of the other professions, but the engineers, I insist, have a contribution to make to public service and they have an obligation to give that contribution. This distinction which has been established by your association should mark this necessity and should stimulate activities of our engineers in such service."

Reading of monographs on the status of engineering throughout the world was a feature furnished by representatives of the twenty-one foreign nations represented. Dr. C. E. Grunsky, president of the American Engineering Council, read the paper on Engineering in the United States.

The society's fiftieth anniversary medal was presented to each of the engineers who had summarized developments in their respective countries. The awards were made by the ambassador or minister of the respective nations.

Four other medals were presented, as follows: The Guggenheim Medal for the Advancement of Aeronautics, to Orville Wright; the American Society of Mechanical Engineers Medal, to William Leroy Emmett, of the General Electric Company, for his development of the steam turbine and electric propulsion of ships; the Gantt Medal, to Fred G. Miller, former editor of "The American Machinist," for achievement in scientific management; the Melville Medal, to Joseph W. Roe, of New York University, for the presentation of the best technical paper.

Theodore Jesse Hoover, the President's brother, attended the convention. Dean of the School of Engineering at Leland Stanford, California, like the President he has had a distinguished career as an engineer.

Extension Course in Gas Measurement

RECOGNIZING the widespread need for courses of instruction in the various branches of measurement engineering, the Southern California Meter Association has organized an Educational Department, made up of outstanding measurement engineers of Southern California.

Through its Educational Department the Association is now offering a Course in Gas Measurement, prepared under the supervision of the department and directed by Professor L. L. Sutherland, B.S., M.S., University of Southern California. Professor Sutherland has a background of valuable experience, including several years' instruction in industrial courses at the Oklahoma School of Mines. For the past two years he has specialized with much success in evening courses covering gas measurement. Metermen and measurement engineers of Southern California have gained much benefit from these courses, and the same type of instruction in gas measurement fundamentals will be offered to the industry at large through the Association's Extension Course.

The Extension Course in Gas Measurement is open to anyone within the reach of mail. Each student will receive individual attention and will have every opportunity to present his individual practical and scientific problems for consideration.

Correspondence should be addressed to Professor Sutherland, P. O. Box 1100, Station C, Los Angeles, Calif.

Industrial Publicity

The Publicity Committee, Industrial Gas Section of the American Gas Association, directs attention to the following articles, recently published:

"Steering Gears Through Production." *American Machinist*, March 27, 1930.

"Shoe Manufacture." *Materials Handling*, March 1, 1930.

"Gas Bakes 4500 Loaves Hourly." *New South Baker*, March 1, 1930.

"Convected and Radiated Heat in Core Ovens." *Canadian Foundryman*.

"Manufacturing Toys." *Industrial Finishing*.

"Radio Tube Manufacture." *Radio Engineering*, April 1, 1930.

"Modern Heat In Ham Boiling." *Delicatessen*, April 1, 1930.

"Cooked Meat Preparation." *National Provisioner*, April 5, 1930.

"Automatic Control Saves \$1500." *Wire & Wire Prod.*

"St. George Hotel." *Hotel Gazette*, April 1, 1930, *American Hotel Journal*, April 1, 1930.

Convention Calendar

Missouri Association of Public Utilities,

Springfield, Mo.

May 1, 2, and 3.

Western Div., Natural Gas Dept., A. G. A.

Roosevelt Hotel, New Orleans, La.

May 5, 6, 7, and 8.

Joint Production and Chemical Conference,

Hotel Cleveland, Cleveland, Ohio

May 21, 22, and 23.

Southern Gas Association,

Savannah, Ga.

June 10 to 13.

National Electric Light Association,

San Francisco, Calif.

June 16-20.

World Power Conference,

Berlin, Germany.

June 16-20.

Wisconsin Utilities Association, Accounting Section,

Eau Claire, Wis.

June 19-20.

American Electric Railway Association,

San Francisco, Calif.

June 23-26.

Canadian Gas Association,

Halifax, N. S.

June 24 and 25.

Pacific Coast Gas Association, Annual Northern Conference, Seattle, Wash.

June 26 and 27.

Michigan Gas Association, Grand Hotel, Mackinac Island, Mich.

June 30, July 1, and 2.

Wisconsin Utilities Association, Commercial Section, Greenbay, Wis.

July 31 and Aug. 1.

Pacific Coast Gas Association, Hotel Huntington, Pasadena, Calif.

Sept. 9-12.

Empire State Gas & Electric Association,

Saranac Inn, N. Y.

Sept. 18 and 19.

Illuminating Engineering Society, John Marshall Hotel, Richmond, Va.

Oct. 7-10.

American Gas Association, Municipal Auditorium, Atlantic City, N. J., October 13-17, Alexander Forward, 420 Lexington Avenue, New York, N. Y., Managing Director.

New England Gas Association, Hotel Statler, Boston, Mass.

Feb. 3, 4 and 5, 1931.

Death of Mr. Brady Loss to Industry

WHEN N. F. Brady died at his home in New York City, March 27, the gas industry lost an outstanding figure and conspicuous personality. His passing brought to mind an imposing array of accomplishments and the tremendous influence of the man.

Prominently known in the gas industry—he was a member of the American Gas Association since 1918—Mr. Brady's death created profound sorrow throughout the industry. His multiple and versatile interests and the magnitude of his undertakings prevented active participation in Association Affairs, but it was inevitable that a strong relation exist. His father had been a powerful factor in the early gas field and was active in developing gas lighting in Chicago.



Mr. Brady

Mr. Brady's chief interest was apparently in New York City public utilities. He was the controlling factor in the consolidation of the Consolidated Gas Company of New York with the Brooklyn Edison Company, which gave the new combine practical control of the field in New York City, Westchester County and on Long Island.

In addition to his connection with scores of other institutions, Mr. Brady was a member of the boards of the following companies: Consolidated Gas Company of New York, Bronx Gas and Electric Company, Central Union Gas Company, East River Gas Company, New Amsterdam Gas Company, Queens Gas Company, and Astoria Light, Heat and Power Company.

He was born in Albany in 1878 and his position as an eminent financier was assured from the beginning by his father's accumulation of vast public utility holdings. He was educated at Albany Academy and Yale University, graduating from the latter in 1899.

His was a prominent figure in Wall Street; he sat in the inner circle which shaped the destinies of huge corporations for nearly thirty years.

Affiliated Association Activities

Pennsylvania Natural Gas Men's Association

MEMBERS of the Pennsylvania Natural Gas Men's Association held their monthly dinner-meeting in the Norse Room of the Fort Pitt Hotel, Pittsburgh, Pa., on March 27.

Following the dinner, the Triangle Quartet, of the Philadelphia Company, composed of Neal Mowry, R. C. Reagan, Glenn Darling, J. H. McGowan and Oliver Evans, pianist, rendered a number of selections.

The A. G. A. playlet, entitled "Service," was successfully produced by a cast of eight players from among the personnel

handling and adjusting of various types of complaints.

Following the playlet, R. A. Gawthrop, in charge of the safety department, Hope Natural Gas Company, at Clarksburg, West Virginia, gave an interesting discussion on his company's methods of securing the cooperation of their personnel in the carrying out of safety methods in natural gas operations.

Pacific Coast Gas Association

A MEETING of Commercial Section members of the Pacific Coast Gas Association took place in Tacoma, Washington, on March 21. This was the third

coma, and by A. E. Higgins, field representative of the American Gas Association.

The next regular meeting of the Pacific Coast Gas Association will be its annual northern conference in Seattle, June 26 and 27.

Empire State Gas & Electric Association

THE annual meeting of the Empire State Gas & Electric Association's Gas Section, held at Elmira, N. Y., March 27 and 28, was pronounced the most successful ever held with more than 125 engineers in attendance. The chairman of the section, R. Van Vliet, of the New York & Richmond Gas Company, presided.

Officers elected for the ensuing year follow: M. F. Clement, Rockland Light & Power Co., Middletown, N. Y., chairman, and Victor Starzenski, New York Power & Light Corp., Albany, N. Y., vice-chairman.



Mr. Clement

Wisconsin Utilities Association

A PROGRAM of timely subjects and important speakers is being prepared for the convention of the Accounting Section of the Wisconsin Utilities Association to be held at Eau Claire, Wis., June 19 and 20. The chairman, A. J. Bohn, has already arranged to have H. M. Brundage, vice-president of The Consolidated Gas Company of New York, address the gathering.

Illinois Gas Association

AT the twenty-sixth annual convention of the Illinois Gas Association held in Springfield, Ill., March 19 and 20, H. T. East, of the Public Service Company of Northern Illinois, was elected president, and H. A. Klimmann of the Peoples Power Company was elected vice-president.



Mr. East

New England Gas Association

C. D. WILLIAMS, executive secretary of the New England Gas Association, announces that February 3, 4, and 5 have been selected for the 1931 annual meeting of his association, to be held in the Hotel Statler, Boston.



Players standing from left to right are: Miss Josephine Boitano, Joseph Fillinger, William Torrence, Miss Pearl Narrigan, Charles H. Nist, Miss Jane Swearingen, Louis J. Conselmi, and W. H. Ferguson, Director; Seated at desk: William Kapphan

of the Peoples Natural Gas Company, Manufacturers Light & Heat Company and Equitable Gas Company, under the direction of W. H. Ferguson. The cast of the players was as follows:

Service Clerk, William Kapphan, Peoples Natural Gas Company; Service Manager, William Torrence, Peoples Natural Gas Company; Italian Customer, Louis J. Conselmi, Peoples Natural Gas Company; Interpreter, Joseph Fillinger, Equitable Gas Company; Home Service Worker, Pearl Narrigan, Manufacturers Light & Heat Company; First Irate Customer, Jane Swearingen, Manufacturers Light & Heat Company; Second Irate Customer, Josephine Boitano, Equitable Gas Company, and Third Irate Customer, Charles H. Nist, Equitable Gas Company.

The playlet is a humorous sketch depicting various typical incidents in the daily life of a service manager of a gas company and illustrating the satisfactory

divisional sales meeting of the year, similar meetings having already been held in San Francisco and Los Angeles.

The program of the Tacoma meeting was informal, almost everyone of the sixty men in attendance making some contribution to the program. J. Earl Jones, of Seattle, chairman of the Commercial Section, presided. C. Y. Bowers, vice-president and general manager of the Washington Gas and Electric Company, welcomed the visitors to Tacoma, and R. W. Coblenz, sales manager of that company, made all arrangements for the meeting and supervised the program.

The theme of the program was load building, and included discussions of advertising for large and small companies, appliances, cooperation between company departments, refrigeration, water heating and househeating. The meeting closed with an evening dinner at the Tacoma Hotel addressed by D. J. Young, of Ta-

Personal and Otherwise

W. B. Trammell and Colonel George D. Sears were recently appointed vice-presidents of the Houston Natural Gas Company by the board of directors. Both men have been active in the company's management and in the development of its expansion during recent months. Mr. Trammell was general manager for more than a year and Colonel Sears played a prominent part in the legal department.



W. B. Trammell

D. M. Curran has resigned as president of the St. Louis Gas and Coke Corporation. O. L. Pringle, formerly connected with the Crucible Steel Company, has been made vice-president and general manager and has taken active charge of the corporation temporarily.



G. D. Sears

H. Boyd Brydon, chief mechanical engineer for Byllesby Engineering Corporation, has resigned.

Harry P. Carroll, former district manager of the Southern District of the Dixie Gas and Fuel Company and Dixie Gulf Gas Company, subsidiaries of United Gas Company, has become operating manager of the Houston Gas and Fuel Company, another United subsidiary. W. B. Currey, who has been district superintendent of another district of Dixie Gas and Fuel Company, will succeed Mr. Carroll.

Luther S. Williams has resigned as president and general manager of The Harrisburg Gas Company, and Norman B. Bertolette has been elected to succeed him. Mr. Williams, who has completed nearly forty-five years in the public utility business, will retire from active work but will continue to be associated with the company in a consulting capacity. Mr. Bertolette has had a very broad experience in public utility management.



L. S. Williams

M. D. Gilbert has been placed in charge of the new branch office in Houston, Texas of the Pittsburgh Equitable Meter Company.

Winthrop E. Mange has been made assistant general manager of the New Bedford Gas and Electric Light Company, recently acquired Associated Gas and Electric subsidiary.

Miss Dorothea Mudd, of the Los Angeles Gas and Electric Corporation, recently won the annual beauty contest of the Pasadena Optimist Club, Pasadena, California.

William M. Martin, has been appointed general superintendent of the Capitol Division of the New York Power and Light Corporation and will have supervision of both gas and electric operations throughout that territory.



N. B. Bertolette

John E. Kelly, consulting engineer of New York, has been elected vice-president and director of the Twin States Natural Gas Company formed by the merger of ten natural gas companies in Kentucky and West Virginia.

H. B. Flowers was re-elected president of the New Orleans Public Service, Inc., at the annual meeting of the board of directors held recently.



H. B. Flowers

John J. Quinn, manager of the Quincy division of the Boston Consolidated Gas Company, has been advanced to the position of assistant to the vice-president in charge of sales over all the Boston Consolidated territory. Mr. Quinn will continue his former duties in addition to those of his new office.

John H. Maxon has resigned as general manager of the Central Indiana Gas Company, Muncie, Indiana. E. A. Angley has been named as his successor.

Richard P. Kraft, who was formerly in charge of the distribution department of the New Haven Gas Light Company, was appointed engineer of that company recently.

A. J. Peters has been made general sales manager of The Consolidated Gas Company of New York and Affiliated Gas Companies, and George Ostlund has been named assistant to the general sales manager, according to an announcement by Oscar H. Fogg, the company's vice-president in charge of commercial relations. Mr. Peters has been assistant general sales manager of the company and now assumes the position made vacant by the resignation of G. M. Karshner. Mr. Ostlund was formerly connected with the Westchester Lighting Company.



A. J. Peters

Tony Mattes, of the Texas Cities Gas Company at Galveston, is said to be the oldest gas man in Texas in point of service. He has been pumping drips for fifty-two years.



Geo. Ostlund

Horace H. Clark has resigned as vice-president of the United Public Service Company, due to merger of that company with the Middle West Utilities Company.

Joy J. Wiens, of the Union Public Service Company, at Ottawa, Canada, has been made manager of the Union Public Service Company at Baldwin, Kansas.

Charles T. Aaron has been appointed general manager of The Beckwith Company.

Arthur Hewitt, formerly general manager of the Consumers' Gas Company of Toronto, was recently elected vice-president by the board of directors to succeed the late Dr. F. LeM. Grasett. Thomas Bradshaw was elected a director and F. Gordon Osler was appointed a member of the executive committee.



Arthur Hewitt

Home Service As a Sales Activity

By E. R. ACKER

General Commercial Manager, Central Hudson Gas and Electric Corporation

IS home service a purely new business function, with sales as its final objective, or is it a great philanthropic service performed out of the goodness of its heart by the gas company for the benefit of woman-kind?

The answer to this question would seem to be obvious, were it not for the fact that during the growth of home service work towards its present position as one of the promotional activities of the industry, it has been looked upon by some companies as something over and above, or at least detached from the companies' sales efforts. Our feeling is exactly opposite—that home service can only be justified if it can be developed as an effective part of the total sales effort. If some other type of sales effort can be carried on for the same expenditure with more effective results from all standpoints, then certainly no company would be justified in continuing its home service activity. Home service by itself, considered purely as a service to the customer, would be extremely difficult to justify. As a part of a sales program or sales policy, it can be made very effective.

It is not possible, however, to single out home service and attempt to justify it on a tangible dollars-and-cents basis any more than it is possible to separately justify advertising, the servicing of appliances or any other activity which we carry on. It is merely a question of how, in any particular case, the money is to be spent which it is necessary to spend to produce a certain result, and whether in the end the total amount spent in all phases of the sales effort is justified by the additional business produced. Certainly no company should carry on a home service activity if the management does not believe that it is a productive part of the selling activity and if they do not believe that the customer is willing to pay for that kind of effort in the rate.

The following is a statement of the policy and plan of the Home Service Activities of the Central Hudson Gas

& Electric Corporation for 1930, offered merely as an example of how our company attempts to conduct the Home Service Activity as a purely selling effort:

"The purpose of the Central Hudson Gas & Electric Corporation in maintaining a Home Service Bureau is to increase the sale of gas and electricity to our residential customers.

1. By keeping in use or increasing the use of appliances already installed in our customers' homes.
2. By assisting in the sale of new appliances by methods which promote the knowledge of, and increase the desire for, these appliances.

"The company believes that this type of promotional and selling work can be accomplished by the type of contact with customers obtained by our Home Service Bureau to a degree which would not be possible in any other way. The program of the Home Service Bureau is planned with the idea of covering the whole field of home management and home improvement as related to the increase and more efficient uses of gas and electricity. The work of the Home Service Bureau girls is directed along selling lines not only in the programs of their classes but in all their other contacts with our customers. In particular their work emphasizes the type of appliances which the company is actively engaged in promoting, such as the storage water heater and refrigerator.

"To carry out this policy our Home Service Bureau is operated by home service girls in each of the major districts of the company. The very nature of this work requires an intimate contact with our customers, so that in all cases home service work is carried out as a distinct district function with the home service director reporting to the district manager. The girls being located in this way in a certain district become familiar with all the problems in their own particular district and are able to make the acquaintances and contacts necessary in increasing

the scope of their work. Matters of general policy, the part taken by the Home Service Bureau in new activities, arrangement of programs and comparison of methods used in different districts are discussed in meetings of the girls of the Home Service Bureau each month. Girls are selected for Home Service Bureau work who have the training and capacity for the understanding of home economics in general and of the use of gas appliances, in particular. Every effort is made to give them further training and experience along these lines by taking advantage of outside classes such as are furnished by the manufacturers.

"Cooking being the primary interest of the woman in the home and the one field in which instruction can be given only by women adequately trained, naturally receives the principal emphasis in the home service work. Regular classes are held in all districts according to the local requirements. For this purpose home service rooms are maintained in the larger districts, well equipped with the latest models of all the major appliances for demonstration purposes and in the smaller districts arrangements are made for classes either in our own office or in some local hall.

"While the general program of the classes is built around the cooking lessons, every effort is made to make these programs as broad as possible and in the course of lessons the use of all the other appliances is brought out, particular emphasis being made on water heating and refrigeration.

"In addition to the regular classes the girls are prepared to follow up all installations of major appliances, including refrigerators, ranges, and water heaters, as well as to render assistance to customers in their homes in the use of the smaller appliances. In their follow-up calls they are prepared to make minor adjustments in the appliances and to discuss their use with the customer in such a way as to keep them thoroughly sold on the use and cost of operation of the appliances.

"As the usefulness of home service work is just as applicable to appliances whether purchased from us or from other dealers, the girls are at all times ready to assist any dealer in following up his sales, as well as our own, and in fact this policy is carried through all their work.

"Some of the numerous other activities of the Home Service Bureau in carrying out this promotional and educational work are as follows:

Use of home service room for social or business meetings of Parent-Teacher Association or other similar local organizations.

Talks before business women's or business girls' clubs.

Lectures on appliances to domestic science classes of local schools.

Lectures or instructions on dietetics for undernourished children in cooperation with city and county nurses.

Demonstrations, lectures and classes for the county farm bureau or local grange organizations.

Instructions of classes in local welfare organizations such as the Lincoln Center in Poughkeepsie.

Regular classes in home lighting including decorative effects and the construction of lamp shades.

Assistance in refrigeration program through talks on food preservation, and preparation and care of food material

and desserts used in refrigerators demonstrated on our floors or in special demonstrations.

Assisting our customers in the planning of decorations, menus, etc., for either private entertainments or meetings of social organizations.

Sale of food prepared by class members conducted for the benefit of and in cooperation with local hospital boards and other charitable institutions.

Cooperation with local Girl Scout councils, including instructions in laundry work, cookery, home nursing, dietetics, handicraft and first aid. This assistance is also available to girls' friendly societies or other church organizations.

Assistance rendered dealers in caring for their floor display and also in conducting dealer demonstrations of appliances.

Assistance at county fairs and other public demonstrations.

Classes for company salesmen, dealer-salesmen and company employees in the construction and use of appliances.

Testing and reporting on new appliances.

"Home Service work being recognized as a distinctly commercial function, the girls are at all times encouraged to be 'sales-minded' in their contacts with customers and to encourage them in every possible way in further taking advantage of the use of gas and electric service in their homes."

Announce Plans to Pipe Gas to Chicago

Insull, Son & Co., Inc., have announced the completion of preliminary negotiations which are expected to result in the delivery of natural gas from the Texas "Panhandle" to the Chicago District.

Associated in this project with Insull, Son & Co., Inc., are the Cities Service Company, the Texas Company, the Phillips Petroleum Company, the Skelly Oil Company, the Columbian Carbon Company and the Standard Oil Company (of New Jersey). These interests own, or have the right to receive gas from, a large amount of acreage in the "Panhandle" field, all of which is to be placed at the disposal of the project. A conservative estimate of the gas reserve thus provided is 4,000,000,000 cu. ft.

The Peoples Gas Light and Coke Company will distribute the natural gas in Chicago, probably as a part of its general supply. It is expected that the Public Service Company of Northern Illinois, the Western United Gas and Electric Company, the Illinois Northern Utilities Company and other utility companies will assume the distribution in their respective territories in northern

and northeastern Illinois. The Northern Indiana Public Service Company, serving communities in Northwestern Indiana, may also arrange for a supply of the gas. As the project is developed, still other utility enterprises may become affiliated with it.

Bringing this natural gas to the Chicago District will require a pipe line about 950 miles long and probably not less than 22 inches in diameter.

Marketing of Liquefied Petroleum Gas

ARRANGEMENTS for a survey of the general conditions attending the marketing of liquefied petroleum gas have been made by the United States Bureau of Mines, through its petroleum economics division. This analysis will include a survey of sales and distribution of liquefied petroleum gases to domestic and industrial consumers over a period of years, and of the industrial uses for which this commodity is now being distributed. This survey is being undertaken in response to a number of requests which have been received for specific information regarding the growth in the use of this fuel.

THIRD EDITION OF "HOUSE HEATING" AVAILABLE

REVISED, the third edition of "House Heating," one of the American Gas Association's publications which has been in heavy demand, recently came from the press. This is in response to the ever-rising demand, not only from gas companies but also from heating contractors, manufacturers and dealers for the latest, most complete material relative to gas house-heating. It presents, in a compact illustrated volume of 136 pages, containing charts and tables, a comprehensive study of the field and a great deal of additional data not included in former editions.

This book is available to members at \$1.50 a copy or it may be had at a lower price in quantity lots. All orders should be directed to the American Gas Association, 420 Lexington Avenue, New York, N. Y.

Harvard Course for Executives

ANNOUNCEMENT of the details of the third special session for business executives to be held at the Graduate School of Business Administration, Harvard University, has been made by John C. Baker, Assistant Dean. This course, which will take place during the month of July, has been shortened from six weeks to four weeks, because of the feeling that a man can more readily arrange to be away from his business for that period. However, in order to cover the same ground, there will be classes six days a week. The enrollment again will be limited to fifty in the interests of informal class discussion.

The course in public utility management and economics again will be offered by Professor Philip Cabot.

The rapid growth in the public utility industry, and the great changes that have taken place in American business conditions during the last twenty years have made necessary a far more intimate knowledge of practical economic principles in the public utility field than was formerly required. The course will deal with the fundamental economic problems of the industry and with the principles on which sound management rests, and should be particularly valuable to men whose previous training has been restricted to the engineering and technical phases of the industry.

The course aims to indicate a method of analyzing the business problems with which the executive is faced with a view to their solution by reason and not by guesswork.

The discussions will be based on actual situations arising in the industry.

Manufacturers Section

F. G. CURFMAN, Chairman

C. W. BERGHORN, Secretary

E. S. DICKEY, Vice-Chairman

List of Convention Exhibitors Grows Rapidly

APPICATIONS for exhibit space at the Twelfth Annual Convention of the American Gas Association, which will take place October 13-17 in the City Auditorium, Atlantic City, N. J., are being received at Headquarters earlier than usual this year, and in greater volume than heretofore.



Mr. Berghorn

On April 21, C. W. Berghorn, Director of Exhibits, reported that 85 per cent of the space available in the big exhibit hall of the Atlantic City Auditorium had been reserved.

Since that time the percentage of space contracted for by manufacturers of gas appliances and others has increased rapidly. On April 11 the list of those who will exhibit at the Convention was as follows:

Abendroth Brothers; A-B Stove Co.; Adams Bros. Mfg. Co., Inc.; Air Reduction Sales Co.; Alpha-Lux Co., Inc.; Aluminate Company, Inc.; American Foundry & Furnace Co.; American Gas Furnace Co.; American Gas Journal; American Gas Products Corp.; American Heater Corp.; American Meter Co.—Griffin & Co., John J., Helme & McIlhenny, Maryland Meter Works, McDonald & Co., D., Metric Metal Works, Tufts Meter Works, Nathaniel; American Stove Co.—Clark & Co. Div., Geo. M., Dangler Stove Co. Div., Direct Action Stove Co. Div., New Process Stove Co. Div., Quick Meal Stove Co. Div., Reliable Stove Co. Div.; Autogas Corp.; Automatic Gas Steam Radiator Co.; American Cast Iron Pipe Co.

Bailey Meter Co.; Barber-Greene Co.; Barstow & Co., W. S.; Bartlett Hayward Co.; Bartlett & Snow Co., C. O.; Bauer & Black; Beckwith Co.; Bernitz Furnace Appliance Co.; Blodgett Co., G. S.; Boone County Coal Corp.; Bristol Co.; B-Line Boiler Co.; Bryan Steam Corp.; Bryant Heater & Mfg. Co.; Bullard-Davis, Inc.; Bingham & Taylor Corp.; Barstow Stove Co.; Bowser Service Corp.

Carrier-Lyle Corp.; Chambers Mfg. Co.; Chaplin-Fulton Mfg. Co.; Chicago Bridge & Iron Works; Cleveland Gas

Burner & Appliance Co.; Cleveland Heater Co.; Cleveland Trencher Co.; Clow & Sons, James B.; Columbus Heating & Ventilating Co.; Connelly Iron Sponge & Governor Co.; Connersville Blower Co.; Crane Company; Cribben & Sexton Co.; Crown Stove Works; Cruse-Kemper Co.; Continental Stove Corp.; Cutler Hammer, Inc.

Dearborn Chemical Co.; Detroit-Michigan Stove Co. (Garland Div.); Detroit-Michigan Stove Co. (Jewel Div.); Dun-Rite Clock Device Co.; Duo-Tor Mfg. Co.; Dresser Mfg. Co., S. R.

Economy Governor Co.; Electric Indicator Corp.; Electrolux Refrigerator Sales, Inc.; Ensign-Reynolds, Inc.; Estate Stove Co.; Eriez Stove & Mfg. Co.

Fisher Governor Co., Inc.; Floyd-Wells Co.; Foxboro Co., Inc.; Fuller & Warren Co.

Gas Machinery Co.; Gas Purifying Materials Co.; General Ceramics Co.; General Gas Light Co.; Glenwood Range Co.; Groble Gas Regulator Co.; Guardian Gas Appliance Co.; Grant Mfg. Co.

Harper-Wyman Manufacturing Co.; Heating & Ventilating; Hill, Hubbell & Co.; Hoffman Heater Co.; Homestead Heater Co.; Hotstream Heater Co.; Humphrey Co.; Hurley Machine Co.; Hones, Inc., Chas. A.

Improved Equipment-Russell Engineering Corp.; Inertol Co., Inc.; Isbell-Porter Co.

Johns-Manville, Inc.; Johnson Gas Appliance Co.; Judelson Dryer Corp.

Kelly, Inc., John G.; Kernit Incinerator Co.; Kompak Co.; Koppers Co.

Lamneck Co., W. E.; Lattimer Stevens Co.; Lavino & Co., E. J.; Linde Air Products Co.; Lindemann & Hoverson Co., A. J.; Lovekin Water Heater Co.; Lambert Meter Co.; Littleford Bros.

Majestic Mfg. Co.; Maehler Co., Paul; McWane Cast Iron Pipe Co.; Mears-Kane-Ofeldt, Inc.; Merco Nordstrom Valve Co.; Milwaukee Gas Specialty Co.; Minneapolis-Honeywell Regulator Co.; Mohawk Asphalt Heater Co.; Moore Brothers Co.; Mueller Co.; Mueller Furnace Co., L. J.; Mulcare Engineering Co.; Minwool Insulating Co.

National Lead Co.; National Tube Co. Ohio Foundry & Mfg. Co.

Partlow Corp.; Patrol Valve Co.; Peerless Heater Co.; Peerless Mfg. Co.; Peninsular Stove Co.; Pennsylvania Furnace & Iron Co.; Permutit Co.; Philfuels Co.; Pittsburgh Equitable Meter Co.; Pittsburgh Coal Co.; Pittsburgh Water Heater Co.; Porcelain Enamel & Mfg. Co.; Perco-

Steril Machine Corp.; Public Service Electric & Gas Co.

Reynolds Gas Regulator Co.; Robbins Publishing Co.; Roberts & Mander Stove Co.; Roberts Brass Mfg. Co.; Roberts-Gordon Appliance Corp. Robertshaw Thermostat Co.; Roots Co., P. H. & F. M.; Roper Corp., Geo. D.; Rudy Furnace Co.; Ruud Manufacturing Co.; Richmond Radiator Co.; Ray-Glo Corp.

Safety Gas Lighter Co.; Safety Gas Main Stopper Co.; Sands Mfg. Co.; Semet-Solvay Engineering Corp.; Slattery & Bro., J. B.; Smith Mfg. Co., A. P.; Spencer Thermostat Co.; Sprague Meter Co.; Stacey Bros. Gas Construction Co.; Stacey Mfg. Co.; Standard Gas Equipment Corp.; Stat-Amatic Instrument & Appliance Co.; Superior Meter Co.; Superior Screw & Bolt Co.; Surface Combustion Co.; Sweet & Doyle Foundry & Machine Co.; Selas Co.; Sherwin Williams Co.

Tappan Stove Co.; Time-O-Stat Controls Co.

United Engineers & Constructors, Inc.; United States Pipe & Foundry Co.; Universal Sand Equipment Co.; Utilities Publication Co.

Victaulic Company of America. Wailes Dove-Hermiston Corp.; Walker & Pratt Mfg. Co.; Watts Regulator Co.; Welsbach Co.; Western Gas Construction Co.; Wilcolator Company; Wood & Co., R. D.

Youngstown Pressed Steel Co.

Office Appliances

Addressograph Co.; Burroughs Adding Machine Co.; Coxhead Corp., R. C.; Dick Co., A. B.; Gestetner Duplicator Co.; Felt & Tarrant International Business Machines Corp.; Remington Rand Business Service, Inc.; Underwood Elliott Fisher Co.

Offers Mailing Service

THE Bowser Service Corporation, New York, announces the addition of an addressing and mailing department to the service which it is rendering utility companies who are using its magazines for women—*Beauty at Home* and *Comfort at Home*.

George R. Stimbeck has been appointed superintendent of the gas plant of the Consumers Power Company at Flint, Mich.

J. M. Mitchell has been promoted to sales supervisor of the Hester Street office of The Consolidated Gas Company of New York.

Commercial Section

G. E. WHITWELL, Chairman

J. W. WEST, Jr., Secretary

E. R. ACKER, Vice-Chairman

New England Regional Sales Conference June 12-13-14

THE Sixth New England Regional Gas Sales Conference, sponsored annually by the New England Gas Association and the American Gas Association, will be held June 12, 13 and 14 at Hotel Griswold, New London, Connecticut.

The meeting will open Friday Afternoon, June 13, at 1 P.M. with introductory remarks by J. H. Sumner chairman of the Cambridge Gas Light Company, Cambridge, Mass.

Among the topics to be covered are:

Message from the President of the New England Gas Association.

Developing Gas Refrigeration in New England.

Refrigeration Sales in Smaller Communities.

Refrigeration Sales in a Holding Company.

What Electric Competition Means to the Gas Company.

Publicity Conference Report.

Conference Banquet

Friday Evening, June 13, 1930
7:00 P.M.

Followed by dancing

Saturday Morning, June 14, 1930
10:00 A.M.

Water Heating from the Health Angle. Enlisting the Dealer as a Gas Appliance Merchandiser.

The Gas Industry Sales Job in New England from a Newcomer's Standpoint.

J. D. Taylor, chairman of the Manufacturers Division of the New England Gas Association, offered to take care of the entertainment features of the Conference as was done last year. A vote of thanks has been rendered for this action on the part of the Manufacturers Division. The committee in charge will be: A. M. Slattery, chairman; J. H. McPherson and J. D. Taylor.

The membership of the *New England Regional Gas Sales Council* is as follows:

J. H. Sumner, chairman, Cambridge Gas Light Co., Cambridge; J. W. West, Jr., secretary, A. G. A. Headquarters, New York; E. W. Allen, Lynn Gas & Electric Co., Lynn, Mass.; R. F. Atwood, General Gas Light Co., Boston; William Gould, Gas & Electric Improvement Co., Boston; C. R. Kimball, Walker & Pratt Mfg. Co., Boston; Harry O. King, Standard Gas Equipment Corp., Boston; J. J. Mc-

Kearin, Lowell Gas Light Co., Lowell, Mass.; J. J. Quinn, Boston Consolidated Gas Co., Boston; J. D. Taylor, Walker & Pratt Manufacturing Co., Boston; W. H. Walsh, Connecticut Light & Power Co., Hartford; M. B. Webber, Athol Gas & Electric Co., 150 Congress St., Boston; C. D. Williams, New England Gas Association, Boston; and A. M. Slattery, Hoffman Heater Co., Boston.

A. G. A. Home Service Group



American Gas Association Home Service Committee at Chicago Meeting.

Members of the Home Service Committee of the American Gas Association met in Chicago on March 3, and were guests of The Peoples Gas Light and Coke Company.

After a business session in the morning, the guests were entertained at luncheon at the Palmer House.

Miss Ruth Soule, chairman of the committee, presided.

Mrs. Helen Wagner, director of home economic education and manager of the school lunch rooms of Des Moines, Iowa, was a guest, being present with her daughter, Miss Jane Wagner, of The Consolidated Gas Company of New York. Mrs. Wagner gave a brief description of her work in Des Moines.

Clow Opens New Branches

JAMES B. CLOW & SONS have opened new branches for the distribution of Clow Gasteam Radiators at El Paso, Texas, and Phoenix, Arizona. W. E. Boyd, formerly with the Texas

Cities Gas Company, will be branch manager at El Paso, and Dale Shreeve at Phoenix.

Recent changes in the Gasteam organization sent H. O. Dummert to Kansas City as manager, and made J. Isaac, Jr., Houston, Texas, manager.

Accounting Section

J. L. CONOVER, Chairman

H. W. HARTMAN, Secretary

J. I. BLANCHFIELD, Vice-Chairman

275 Attend Spring Accounting Conference

REPRESENTATIVES from all sections of the United States and some from abroad, who formed a total attendance of 275, took part in the second Annual Spring Conference of the Accounting Section, American Gas Association, which took place at Chicago, April 3 and 4.

In the closing address, "Taking the Convention Home," W. A. Sauer, of the Midland United Company, Chicago, summed up the proceedings of the meeting in the following language:

"From the opening remarks of your Chairman, to the close of the discussion on 'Incentive Wage Plans,' this Conference has been unusually worthwhile. It has demonstrated, at least to me, that our problems, new or old, are receiving more intensive study due to greater experience on the part of those selected to make these studies than ever before. This, however, is a natural and logical sequence, because as we grow older in service, whatever that service may be, we become more confident to express opinions and define cogent reasons for the opinions we offer.

"The opening remarks made by our Chairman, Mr. Conover, were characteristic of the man; they were complete, well thought out, and well expressed, they gave the 'whys and wherefors' for this conference.

"It was unfortunate that due to illness, Mr. Mullaney was unable to deliver his address. He had a dual role. As an executive officer of the company which is your host, he was to extend the 'glad hand' of welcome; as President of the American Gas Association he would, I assume, tell you of the importance of your work and urge you on to renewed efforts.

"Regretting the inability of Mr. Mullaney to be present, our resourceful chairman called on our good friend Mr. Brundage to do the needful, and you were treated to the unusual spectacle of having a native-born Easterner, particularly a 'New Yorker' a thousand

miles away from his native hearth, act the host and extend the 'glad hand' of welcome to you visitors. He did nobly, and to me, a Chicagoan, in a very satisfactory manner. Why, however, he, a man of benevolence, beatitude, and much beloved, should associate his name with a cardinal sin, an act of God, and a provoking restriction, simply because they all begin with 'B,' is quite beyond my understanding.

"And again, 'Taking the Conference Home,' Chicago is entitled to voice an expression. While there is some justification for the most friendly of our neighbors to point their finger at our apparent shortcomings, we feel that we are more sinned against than sinful. Chicago is young and lusty and like children during that same period, at times in its exuberance, expresses itself with a loud and vociferous voice; but regardless of that, it has a pleasing manner and many other attributes that invoke envy and incite invidious comment from many of our sister cities.

"We feel that we are worse than many and probably better than most, but a name once established is hard to live down.

"You, particularly accountants, should appreciate what I am going to state. The following figures were quoted at a meeting of the Chicago Association of Commerce a week or so ago. Based on the number of homicides per 100,000 inhabitants, this great and growing community is placed 16th or 17th, I am not sure which, on the list of American cities. On the same basis, the number of people held up per 100,000 inhabitants, this city is way down on the list, I cannot recall the exact place.

"Frankly, I can cite many figures showing Chicago's position relative to other items in the category of crime to confirm my statement that Chicago suffers more from the criticism directed at it, than it does by its own shortcomings.

"So much for Chicago, it needs no defence beyond its own efforts and the situation now existing, I am sure, will be met and fully met before many months go by.

"I inject the foregoing of these remarks because you are taking the conference home, and, naturally, taking the conference home does not only mean what you have listened to in the way of addresses and reports, but also the effect your surroundings have had on you.

"Major Forward was very kind to the Section in his remarks, but I believe it was a justified kindness. We are all human and we like to be complimented on worth-while accomplishments. Equally timely were his comments telling the accountant of his position in a world of industry, the responsibilities he has to carry in producing facts and knowledge that will permit his executives to steer to their course as well as rightly guided vision and conditions permit. The man who follows the course of these various organizations must anticipate the trend of events, and ladies and gentlemen your place as an accountant is an essential one in helping to prepare the picture so that the anticipation can be made as real and trustworthy as possible.

"Our visitors from England who have complimented us by attending our sessions, I hope, will feel that their time has been well spent. I have visited many of the operating companies of England and Scotland, and I understand fully, how thoroughly and conscientiously they try to meet their problems and how well they have succeeded in many instances. I know, however, their methods are not always our methods, and while many of us may feel egotistical to the point that we think we know better, I am not altogether sure that we are entitled to feel that we do.

"Before passing on to the papers, I would like to say a few words about

the exhibits. In my opinion they are quite unusual. They show many things that make it very apparent that the appliance people are doing their utmost to improve our methods and meet our problems.

"Two types of bill printing-addressing machines are shown. In both of these machines blank paper stock is fed into the machine which turns out a complete bill, ready to go to the billing machine. Three types of calculating machines are demonstrated. Four essentially different billing machines, and one combination billing and card punching arrangement. The latter machine is synchronized with the billing machine, and automatically key-punches cards to be used for securing any statistical data concerning customers, rates and revenue at the same time the bill is made out. Special tabulating and key-punch equipment is shown which has been especially arranged to handle and provide records concerning customers' deposits. Various visible card record equipment adaptable to almost any use, is clearly demonstrated. Equipment for duplicating letters, forms, cuts, etc., clearly demonstrates the advance in that line of work. The exhibits as a whole are extremely interesting and should be carefully studied.

"I am not going to do more than make a brief statement on each paper that has been presented to the Conference. Some I heard personally, others I have read, and on others I have asked for an expression from those who were in attendance.

"The man who cannot take home a great deal of 'food for thought and effort' after listening to Mr. Farwell on his paper, 'Accounting Research for Gas Utilities,' and who has read it through, in my opinion is in a sad way. In the beginning he cites the increasing importance of the accounting officer. Our industry in the past ten years has made very apparent the growing importance of accounting. My recollection is that not so many years ago, the highest position that an accountant could look forward to, was the title of Auditor. Today there are scores of accountants in our industry who carry the title of Vice-President and some who even head the organizations they are with. An active, aggressive, and intelligent accountant, endowed with

good, plain, common sense, can make himself an indispensable part of the organization he is connected with. If he has the attributes I have just mentioned—and is not recognized, frankly, my advice to him would be to look elsewhere, because there are other organizations very willing to accept him. His place in the industry is assured.

"Mr. Farwell's paper outlines what an accountant can do. In my opinion his story is not complete, because I believe the field is even wider than he states, but as I am not here to argue or discuss that matter, I will not go beyond that statement.

"The report of the sub-committee on Consumers Deposit Accounting which was so ably presented by Mr. Cliff, covers a question that is of interest to the accounting and managing executives of almost any company of size. While there may be some points in this report which may not receive full approval from all present, there is a wealth of thought and suggestion offered by Mr. Cliff and his committee, that is worth the attention of any executive who has to do with Customers' Deposits and their control.

"A subject on which I do not believe the last word will ever be said, is Stores Accounting, and the report made by the sub-committee on Stores Accounting and presented by Mr. Karmarsik is a valuable addition to the many that have been made on various phases of this operation. It is a subject that requires constant attention, earnest endeavor, and full cooperation from all concerned, to make it operate so that the full benefits of proper organization and effort can be realized.

"Mr. East's paper on Arrangement, Preparation and Delivery of monthly Service Bills brought out the general lack of cooperative thought in preparing a document which is the principal medium of communicating with our customers and while many of the points cited appeared humorous, the form of bill occasioning the comment may have been the work of some individual present at the meeting or may have been the effort of the executive to whom some individual on this floor is responsible to, and he may have a very difficult task in trying to convince that executive, or if he is the author of the bill, satisfy himself that what Mr. East cited is really as he pictured

it. My own opinion is that a gas bill or an electric light bill is least like an invoice or any instrument of that nature used in commercial work. I cannot offer any real suggestion to improve it except the thought that it might be a subject that this Section or that the Headquarters of the Association might appoint a committee on and endeavor to produce a standard form of bill. While I know many would not use it, it would be a step in the right direction.

"Mr. Brown's paper presented two definite thoughts. The first was the general set-up of our offices, and we all know that in our time we have visited the General Office of some Gas Company whose Customer's Hall was not a credit to the Company. It is a pleasure to know that the tendency is in the order of improvement. The second thought was to dignify the employees' position, and from experience I can assure you this phase pays. I believe in good housekeeping and proper accommodations in the Customer's Hall.

"Mr. R. A. Haas has cataloged the essentials of training employees, and keeping them informed as to their work so that they will make the ideal contact with our customers. Mr. Haas has step-by-step shown the proper requirements in treating with the employees and customers. He has arranged a chart showing the various phases of outlining a training course. He has offered to furnish copies of it to anyone desiring the valuable information it contains. I advise you to obtain a copy. In Mr. Haas's talk he has shown you your obligation in a definite way, both to the employee and the customer.

"Mr. Prezzano, because of the lack of time, unfortunately was restricted in his presentation, but unquestionably he closed the afternoon session with the thought that appeared to be carried out in every paper presented and that was the 'follow through.' No matter how carefully work is studied, and routines and procedures originated to standardize this work, even down to the smallest division of a company's organization, unless such routines and procedures are checked, you will find them neglected. Those routines and procedures that effect customers must

have the 'follow through' that Mr. Prezzano speaks of.

"It seemed to me that the theme of Thursday afternoon's session was keeping close to the customer. If we can concentrate on this thought and get our customer's reactions, and study them for improvement we have within our grasp a large part of the success that is necessary to manage any business.

"Mr. Purcell has brought out forcibly, the value of analysis of sales. He has stressed the value of statistics and cost elements in establishing load factors. While sales statistics may seem a little far afield from the average accountant's problems, it is a subject upon which they really should be called to provide the data, and not leave it to the sales organization to furnish their own wants. This is a never-ending study, and worthy of our deepest consideration.

"Mr. Fue's presentation on the classification of merchandise accounts helped to clear up an accounting problem that has been the subject of considerable thought and discussion for a long period. Uniformity of thought between the merchandise man and the accountant, as far as accounts go, has been considered almost an impractical thing, but by application and study, you will note from the committee's report that they have finally attained something. By the application of the classification submitted, with minor changes because of localization, our accountants can start painting their picture for the executive in charge of sales.

"Mr. McLain, in his paper, outlined a method of payroll accounting which I understand is practiced in his company. He has given you a very complete and carefully explained proceeding. The method followed is quite unusual and possibly requires further study in order to make it applicable to your particular form of organization. As a result of the committee's study, it is very evident that office machinery can be applied in a very beneficial way in the handling of payroll accounting.

"Training the Supervisor and the New Employee.' These subjects on which you have been addressed by Mr. Luce and Mr. Atkinson are always very important. The new employee improperly trained or not sufficiently

trained is at a distinct disadvantage and the company pays, as a result, an expense through inefficiency that would pay several times over the cost of proper training. The training of supervisors has received but very little attention as near as I have been able to determine from investigations that I had made a year or two ago. The supervisor who does not realize the full responsibilities of his position, except in a very routine way, is not only a detriment to the force he has charge of, but is a drag on other parts of the organization wherein his particular operations are reflected, directly or indirectly. However, I can safely say that it is not the supervisor's fault, but is due to the lack of progressiveness on the part of those to whom he answers.

"Incentive Wage Plans,' is a subject that appeals to me very much, but one that has not received the attention it should from the industry. There is no question but that some operations should not be considered from a wage incentive viewpoint, but there are many operations throughout utilities companies, particularly in the larger commercial activities, that could be placed on an incentive wage plan, and the result would not only be highly beneficial to the employee, but the company would improve its service through obtaining a better class of work and a better satisfied personnel, and should gain an economic advantage. All incentive wage plans, however, call for close control and proper supervision.

"I have commented on the program in its entirety.

"My opinion is, it has much to offer of a constructive nature. Each report reflects much thought and experience. Now that that has been told, is that all? The amount expended by utility companies for association activities is relatively a much larger sum than it was some years back. There must be a reason. The answer, beyond a doubt, is that the results obtained are satisfactory. The amount spent for permitting employees to attend conventions and conferences, I believe, has grown proportionately larger than other expenditures. Executives must realize that much is gained by attendance at these meetings. They get the benefit of the most competent minds to pass on a problem, pertinent to

times, conditions and development in the industry. That all get the full benefit of what study, research, and experience has brought out is doubtful. Some companies follow up on reports and addresses carefully, others wait until tests and try-outs have been made elsewhere. Some do not act at all, or they act in a desultory way. It should be the particular duty of every representative of a company who has attended this conference, to report, in general, on every subject that has been presented, and also to see that the subject that applies to a particular executive's field of endeavor is explained to that executive and followed up to see what, if any, action is taken.

"There are many methods followed to disseminate the ideas, suggestions and thoughts contained in reports or voiced in an address. There is no need to explain them here. Get the knowledge to those who should have it, make yourself the assertive force in your company or that part of your company that you are concerned with most, follow through yourself, some of the things you advocate may be worth while. The men who lead in this and other industries are always looking for ideas. They started looking early in their career, and now follow through until they are satisfied with the result, good or bad. They got the habit of taking the conference and keeping it home, but not tucked away. You who have not already followed this course should start with this conference.

"The Chairman told me to close the conference, to wish you godspeed, and a happy return. I do now, and with those words I add these: We have enjoyed your visit and we feel that it has been well worth while to you, and hope the future will bring many more similar occasions."

"Private vs. Government Ownership"

The American Educational Press, 25 West 43rd Street, New York City quotes the following prices on the sixteen-page booklet entitled "Private vs. Government Ownership," by Roger Babson and Professor Fisher: One thousand, \$30 per thousand; 5,000, \$25; 10,000, \$22.50; 25,000, \$20.

Publicity and Advertising Section

JAMES M. BENNETT, Chairman

ALLYN B. TUNIS, Secretary

DONALD M. MACKIE, Vice-Chairman

Gas Industry to Take Part in P. U. A. A. Convention

MEN prominent in the ranks of gas company advertising and publicity departments will take an active part at the annual convention of the Public Utilities Advertising Association, which will take place May 19, 20 and 21, at Washington, D. C. Business sessions will take place in the Venetian Room of the Washington Hotel.

Inasmuch as this meeting will be held in conjunction with the twenty-sixth annual convention of the Advertising Federation of America, an unusually large attendance is anticipated.

The program has been built around the "What, Why and How of Public Utility Publicity and Advertising." In addition to representatives from the gas industry and advertising leaders from other public utility fields, the program will be participated in by prominent men drawn from many walks of public life, newspaper, magazine and advertising fields.

The following well-known figures

are among those who have been invited to speak:

B. J. Mullaney, president of the American Gas Association; P. S. Arkwright, president of the Georgia Power Company; Dr. Louise Stanley, chief, Bureau of Home Economics, United States Department of Agriculture; Owen A. Conner, financial editor, Philadelphia Public Ledger; Congressman Charles A. Eaton, of New Jersey; Edwin S. Friendly, business manager, New York *Sun*; William H. Hodge, vice-president, Bylesby Co.; Henry Obermeyer, The Consolidated Gas Company of New York; Joseph B. Groce, Edison Electric Illuminating Company, Boston; Donald M. Mackie, vice-chairman, Publicity and Advertising Section, the American Gas Association; Howard F. Weeks, The Consolidated Gas Company, of New York, and Earl Whitehorse, McGraw-Hill Publishing Company.

availed themselves of the opportunity of securing helpful direct mail material at much lower costs than if they had been compelled to originate this matter.

That this service is attracting the attention of others outside the industry is indicated by the number of "association" advertisements that are carried in *Public Utility Ad-Views*, a review of the outstanding advertisements of the utility industry published semi-monthly by Vincent Edwards & Company, New York. One issue of *Ad-Views*, recently, carried eight "Association" advertisements.

If you have been planning to subscribe for the service, why not send in your order now, beginning with the June, 1930, issue. This service is \$10 per month, invoices rendered quarterly. A few of the leather binders, made especially for filing the duplicate copies of the advertising copy by departments of service, are available at \$3.50.

P. U. A. A. Annual Out

THE new 1930 advertising annual of the Public Utilities Advertising Association contains more than 500 live, business-producing ideas.

It includes "best by test" utility advertising; institutional, financial, commer-

Art and Copy Service Pleases Gas Advertisers

THE new A. G. A. Art and Copy Service which replaced the Monthly Advertising Service, January, 1930, has been received most enthusiastically by both the manufactured and natural gas branches of the industry, more than 200 of these monthly services going out now and every indication of a steady growth, as the value of this service from a gas sales standpoint becomes more apparent.

Letters from more than fifty gas companies, among them companies that because of mergers were compelled to reduce the number of services, or cancel entirely, as well as those using the service, express the opinion

that the service not only has been greatly improved, but that this improvement continues with each month's service. In addition to the more than 200 gas companies in the United States and Canada that are now using the service, inquiries have been received from four foreign countries, England, Italy, New Zealand and Japan.

The inclusion of the four-page review of advertising of "Other Gas Companies," as well as the samples of effective direct mail advertising used by gas companies, submitted with the service every two months, have proved to be popular. Many companies have



cial, gas, electric, transportation, and water; produced by expert advertising men from coast to coast.

The annual also includes prize awards for the best advertisements of the year.

Industrial Gas Section

C. C. KRAUSSE, Chairman

C. W. BERGHORN, Secretary

D. W. CHAPMAN, Vice-Chairman

Industrial Research Committee Starts Two New Projects

F J. RUTLEDGE, chairman of the Committee on Industrial Gas Research, announces that the committee has started two new industrial gas research projects at the American Gas Association Testing Laboratory in Cleveland. These projects are: "Research in the Elimination of Noise in Industrial Gas Burners" and "A Study of the Characteristics of Burning Gas with Preheated Air."

While industrial gas burners on the whole are quite free from noise, there are some conditions under which noise appears to an objectionable degree. The trend in modern factories is toward better working conditions in every respect and shop noises that some years ago caused no comment today are frowned upon. The future will see a decided demand for absolutely quiet burners and it is in anticipation of this demand that the Committee is investigating all the factors affecting burner and combustion noises, so that they can be avoided by burner designers.

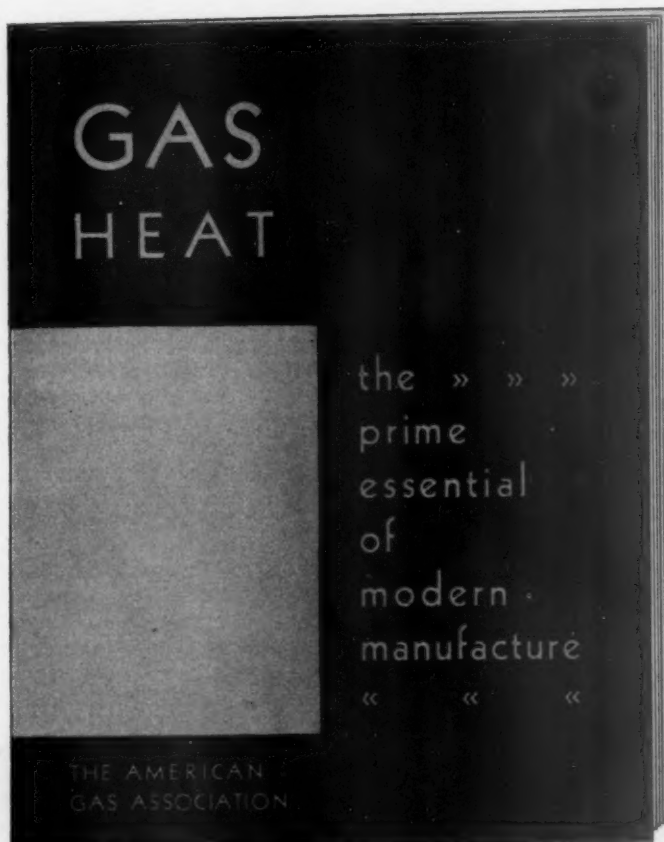
Recuperation admittedly offers one of the greatest possibilities for increasing the efficiency of industrial heat applications. This is particularly true of operations requiring high temperature. There are quite a number of different ways in which the principle of recuperation may be applied. Perhaps the most usual method is that of utilizing the temperature of the hot stack gases to preheat the air, or gas, or both. Other practices utilize the heat from the stack gases for secondary heating purposes or for increasing directly the over-all efficiency of heat application other than by preheating the air used for combustion prior to its mixture with gas. While some investigational work has been done in this field, the principles covering the combustion of gas with preheated air are not generally understood by industrial gas men. It is felt that if all the factors affecting combustion under these conditions are brought out, that in-

dustrial engineers will be glad to utilize them much more extensively than

they have been used up to this time, and to that extent put gas in a better competitive position with the cruder and cheaper fuels.

Two experienced research engineers
(Continued on next page)

Aid for Gas Companies



AS a feature of the Industrial Gas Section's advertising campaign in trade journals the committee in charge has each year prepared a pamphlet which our advertisements state will be mailed upon request.

The 1930 pamphlet is now available, the cover of which is shown above. A great number of gas companies have found the use of this ma-

terial valuable in their contact work with customers and prospective customers, and for that purpose it is made available to members at twenty-five cents a copy. The committee will be glad to furnish a sample copy to any member. All orders should be addressed to the American Gas Association, 420 Lexington Avenue, New York, N. Y.

Industrial Research Committee Starts Two New Projects

(Continued from page 000)

have been assigned to these projects—D. Domizi, a graduate of Case School of Applied Science, is investigating the cause of noises in industrial gas burners. He has had considerable experience, conducting research work in radio noises and distortion in amplifier systems for the National Carbon Company and the Rich Electric Company. He is considered quite an ex-

pert on harmonic analysis and methods of sound recording.

O. K. L. Lutherer, who is in charge of the research in burning gas with preheated air, has been a member of the engineering staff of the American Gas Association Testing Laboratory for several years in which he is an experienced research worker in gas combustion problems. His engineering training was received in Germany where he was later a consulting engi-

neer in Berlin and served four and one-half years in the German Navy, part time as chief engineer of a submarine.

These two projects are the first of a series of new projects being undertaken by the Committee on Industrial Gas Research in a program of expansion this year. They mark the thirteenth and fourteenth project so far undertaken since the beginning of the American Gas Association participation in industrial gas research.

Industrial Gas Bibliography

FOLLOWING is a supplementary list to the recently published Selected Bibliography of Industrial Gas Articles:

GENERAL DATA—A

Combustion—A-III

Fuels and Furnaces ... Flame propagation of combustible gases. Sept. 1929, p. 1413

Heat Treating & Forging ... Interpretation of stack gas analysis May 1929, p. 626
(How deficiencies in fuel utilization may be calculated in terms of CO by determining the amounts of CO₂ and O₂ in the waste gas from combustion.)

Industrial & Engineering Chemistry ... Chemistry and physics of the combustion of gaseous fuels. Feb. 1930, p. 179
(Furnace atmospheres for brick and ceramic ware, Industrial furnace burner design.)

Comparisons—A-IV

Gas Journal (London) ... Comparative costs of fuels for domestic purposes—Series of articles Feb. 26, 1930, p. 573
Mar. 5, 1930, p. 643
Mar. 12, 1930, p. 702

(Experimental data on house heating, cooking, hot water supply.)

Furnace Design—A-V

Fuels and Furnaces ... The economics of insulating industrial heating equipment Feb. 1929, p. 277
(Economical thickness of insulation for continuous and intermittent industrial ovens as determined by cost of heat lost.)

Industrial Gas ... Super refractory burner blocks and piers Feb. 1930, p. 27

Jl. of the Amer. Ceramic Soc. ... Progress in the elimination of saggars in the firing of glost and bisque general ware and glost wall tile Feb. 1930, p. 143
(Methods of eliminating saggars with corresponding benefits.)

Hatcheries—A-VI

Industrial Gas ... Gas fuel for the poultryman. Mar. 1930, p. 9
(45,000 egg incubator described.)

Heat Transfer—A-VII

Blast Furnace and Steel Plant ... Heat transfer in regenerative systems Mar. 1930, p. 449
(Calculation of heat transfer coefficient.)

Cutting—A-XI

Industrial Gas ... Natural gas for flame cutting. Feb. 1930, p. 10
(Cost comparison very favorable to gas. Increase in oxygen consumption negligible with gas.)

Iron Age ... Cutting stainless steel castings Nov. 24, 1927, p. 1447
(Electric.)

Water Heating—A-XII

Electrical World ... Residential water heating ... Feb. 18, 1928, p. 341

Electrical World ... Electric water heating in Europe Feb. 9, 1929, p. 299

Electrical World ... Water heater characteristics (electric) Oct. 12, 1929, p. 745

Plumbers Trade Journal ... Plumbing one of the world's largest stadiums Jan. 1, 1926

Ruud-iments ... Swimming pool business yours if you know how to get it. Apr. 1926, p. 6

Miscellaneous—A-XIV

American Gas Journal ... B.t.u.'s vs. blizzard Feb. 1930, p. 46
(Melting snow and ice from railroad slip switches. Details of heater; gas consumption.)

Chem. and Met. Eng. ... Electrical heating field broadened by container-resistance. Feb. 1928, p. 102

Industrial Gas ... Gas in the plastic age. Feb. 1930, p. 12
(“Platen” type hot press uses gas.)

Industrial Gas ... A modern sewage plant features a gas-fired incinerator. Mar. 1930, p. 21
(Coarse screenings burned in a brick incinerator.)

Iron Age ... Mixing gases for industrial use Jan. 16, 1930, p. 219
(Economies through enriching gases too lean to be used alone; modern mixing devices.)

HEAT TREATMENT OF FERROUS METALS—B

Forging—B-I

- Heat Treating & Forging Forge heating for large pieces. Feb. 1929, p. 219

Hardening—B-II

- Fuels and Furnaces Relation of time and temperature to depth of case in carburizing carbon steels. Jan. 1930, p. 41
(Constants as guide for depth of case under average conditions.)

- Trans. of the Amer. Soc. for Steel Treating. Some notes on the behavior of carbon tool steel on quenching. Feb. 1930, p. 161
(The relationship of quenching range and hardness penetration to the occurrence of soft spots, change of size in hardening and susceptibility to cracking is shown.)

Nitriding—B-IIa

- Fuels and Furnaces Nitride and cyanide hardening of vacuum cleaner parts. Sept. 1929, p. 1393

- Fuels and Furnaces An exceptionally large nitriding furnace installation. Dec. 1929, p. 1907

- Heat Treating & Forging Influence of nitrogen on special steel. Dec. 1929, p. 1583

- Trans. of the Amer. Soc. for Steel Treating. Methods of approximating certain physical characteristics of nitrided steel cases. Jan. 1929, p. 1

Annealing—B-III

- Iron Age Foundries use gas for annealing. Feb. 27, 1930, p. 637

- Iron Trade Review Special heat treatment required in making airplane wire. Jan. 30, 1930, p. 47

Tempering—B-IV

- Industrial Gas. Gas has a part in manufacturing airplane tie rods and wire. Feb. 1930, p. 7
(Patenting or "normalizing" wire to relieve strains set up after cold working. Gas consumption.)

Case Hardening—B-V

- Fuels and Furnaces Case carburizing of steel. Mar. 1929, p. 347

Cyanide Hardening—B-VI

- Fuels and Furnaces Nitride and cyanide hardening of vacuum cleaner parts. Sept. 1929, p. 1393

Miscellaneous—B-XI

- Bulletin No. 3, Int'l Nickel Co., N. Y. Heat treatment and applications of nickel and nickel-chromium steels. (Reprinted from Handbook of A.S.S.T.)

- Bulletin No. 4, Int'l Nickel Co., N. Y. Making steel castings stronger. (Reprinted from Iron Age.)

- Fuels and Furnaces Influence of atmospheres on the heat treatment of steel. Sept. 1929, p. 1345

METAL MELTING—D

Galvanizing—D-III

- Brass World Factors which affect the brightness of hot-dip zinc castings. Feb. 1930, p. 33
(Burnt steel, overpickling, poor quality zinc, overheated bath, iron and acid salts in bath, improper storage conditions produce a dull finish.)

- Electrical World Electric galvanizing. June 29, 1929, p. 1321

- Fuels and Furnaces Gas-fired furnace used in galvanizing refrigeration units. Aug. 1929, p. 1195

Die Casting—D-IX

- Fuels and Furnaces Gas-fired furnaces used in melting alloys for die casting. July 1929, p. 1083

Soft Metals—D-XI

- Iron Age Electric melting pots for white metals. Mar. 28, 1929, p. 881

WHOLESALE BAKING—F

Bread Baking—F-I

- Gas Age-Record. Tests of bread baking ovens. Feb. 1, 1930, p. 131
(Baking, cooling, preheating and loss tests on indirect ovens.)

Miscellaneous—F-IV

- Power Engineer. Engineering and biscuit making. Mar. 1928, p. 97
(Some descriptive notes on the engineering equipment of W. & R. Jacob & Co., Ltd. [Liverpool].)

FOOD PRODUCTS—G

Meat—G-III

- Industrial Gas. Modern heating effects large saving in ham boiling. Mar. 1930, p. 25
(Gas proves economical; figures given.)

Coffee—G-V

- Spice Mill The world's largest coffee roasting plant. June 1929, p. 985

- Supplément au J. des Usines a Gaz La torréfaction des denrées alimentaires. Jan. 5, 1930, p. 25
Dec. 20, 1929, p. 17

Miscellaneous—G-VI

- Chem. & Met. Eng. Drying by recirculation of air. Aug. 1926, p. 480
(Apparatus developed for food dehydration by Dept. of Agriculture suggests improvements in general drying practice.)

LOW-TEMPERATURE BAKING AND DRYING—I

Core Baking—I-I

- American Gas Journal Gas for baking radiator cores. Mar. 1930, p. 54
(Actual operating results on radiator cores.)

- Fuels and Furnaces Core oven installation produces exceptional results. Oct. 1929, p. 1605

- Iron Age Foundry saves by change in fuel. June 13, 1929, p. 1633
(Comparison of oil and gas in core ovens. Tests show advantages from close control of gas heating—unusually high pouring temperature used.)

- Metal Industry. Core baking with electric heat. May 1927, p. 191
(Description of core making covering sands, binders and electric baking.)

- Japanning—I-III*
- Fuels and
Furnaces Ventilation of japanning
ovens Mar. 1929, p. 415
- Fuels and
Furnaces Japanning conveyor ovens
greatly increase production. Apr. 1929, p. 577
- Miscellaneous—I-V*
- Industrial Gas.. Gas has a part in manufactur-
ing airplane tie rods and
wire Feb. 1930, p. 7
(Drying lime coated rods at
300° F. after pickling and wash-
ing.)
- CERAMICS—J*
- Glass—J-I*
- Industrial Gas.. Modern radio tube manufac-
ture Mar. 1930, p. 7
(Detailed description—points
out where gas is applied.)
- Brick—J-II*
- Fuels and
Furnaces A highly efficient tunnel kiln. Jan. 1927, p. 61
- Vitreous Enameling—J-III*
- Jl. of the Amer.
Ceramic Soc. Blistering phenomena in the
enameling of cast iron Jan. 1930, p. 16
(Causes—(1) CO and CO₂ bubbles from oxidation of carbon
on surface during firing of
ground coats; (2) "Microhill" a
thin surface skin acquired by
iron casting in freezing; (3)
"Sponginess" of casting; (4)
Faulty composition or applica-
tion of enamel.)
- Jl. of the Amer.
Ceramic Soc. Effect of furnace gases upon
glass enamels Feb. 1930, p. 126
(Ordinary products of complete
combustion do not harm enamels
—CO₂ very beneficial; H₂O va-
por an exception to rule. SO₂
harmful but can be controlled.
Recuperation benefits in giving
complete combustion. Very hot
diluted air would increase effi-
ciency and produce better
enamels.)
- Supplément au
Jl. des Usines
a Gaz L'émaillage de la toile et de la
fonte. Series of articles .. Aug. 1929 to Oct. 1929
- Frit Smelting—J-IV*
- Supplément au
Jl. des Usines
a Gaz L'émaillage de la toile et de la
fonte—Préparation de la
fritte Sept. 1929, p. 9
- Pottery, Chinaware, Etc.—J-V*
- Industrial Gas.. Modern ceramic kilns Feb. 1930, p. 17
(An interview with Prof. Nash.)
- Terra Cotta, Sewer Tile, Refractories—J-VI*
- Fuels and
Furnaces Firing clay wares Feb. 1930, p. 181
(General discussion.)

Statement of the Ownership, Management, Circulation, Etc., Required By the Act of Congress of August 24, 1912

Of American Gas Association Monthly published monthly at Brattleboro, Vt., for April 1, 1930.
State of New York, County of New York, ss.

Before me, a Notary Public in and for the State and county aforesaid, personally appeared
Allyn B. Tunis, who, having been duly sworn according to law, deposes and says that he is the
Editor of the American Gas Association Monthly and that the following is, to the best of his
knowledge and belief, a true statement of the ownership, management (and if a daily paper, the
circulation), etc., of the aforesaid publication for the date shown in the above caption, required by
the Act of August 24, 1912, embodied in section 411, Postal Laws and Regulations, printed on
the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business man-
agers are: Publisher, American Gas Association, Inc., New York, N. Y.; Editor, Allyn B. Tunis,
New York, N. Y.; Managing Editor, None; Business Managers, None.

2. That the owner is: (If owned by a corporation, its name and address must be stated and
also immediately thereunder the names and addresses of stockholders owning or holding one per
cent or more of total amount of stock. If not owned by a corporation, the names and addresses
of the individual owners must be given. If owned by a firm, company, or other unincorporated
concern, its name and address, as well as those of each individual member, must be given.)
American Gas Association, 420 Lexington Ave., New York, N. Y.; Bernard J. Mullaney, Presi-
dent, 420 Lexington Ave., New York, N. Y.; Clifford E. Paige, Vice-President, 420 Lexington
Ave., New York, N. Y.; William J. Welsh, Treasurer, 420 Lexington Ave., New York, N. Y.;
Alexander Forward, Managing Director, 420 Lexington Ave., New York, N. Y.

3. That the known bondholders, mortgagees, and other security holders owning or holding
1 per cent or more of total amount of bonds, mortgages, or other securities are: (If there are
none, so state.) None.

4. That the two paragraphs next above, giving the names of the owners, stockholders and se-
curity holders, if any, contain not only the list of stockholders and security holders as they
appear upon the books of the company, but also, in cases where the stockholder or security holder
appears upon the books of the company as trustee or in any other fiduciary relation, the name of
the person or corporation for whom such trustee is acting, is given; also that the said two para-
graphs contain statements embracing affiant's full knowledge and belief as to the circumstances
and conditions under which stockholders and security holders who do not appear upon the books
of the company as trustees, hold stock and securities in a capacity other than that of a bona fide
owner; and this affiant has no reason to believe that any other person, association, or corporation
has any interest direct or indirect in the said stock, bonds, or other securities than as so stated
by him.

5. That the average number of copies of each issue of this publication sold or distributed,
through the mails or otherwise, to paid subscribers during the six months preceding the date
shown above is . (This information is required from daily publications only.)

ALLYN B. TUNIS, Editor.

Sworn to and subscribed before me this 31st day of March, 1930.
(Seal)

LAWRENCE P. BROWN,

Notary Public, New York County,
Clerk's No. 464, Register's No. 2B332,

(My commission expires March 30, 1932.)

Advertising Campaign to Sell Coke

AT a meeting of the Managing Com-
mittee of the Publicity and Adver-
tising Section held in Chicago during
March, Keith Clevenger, Director of Pub-
licity and Advertising, reported that
nearly 200 members of the American Gas
Association had subscribed to the new
Art and Copy Service. He pointed out
that of this number, 141 were former
subscribers and 41 new subscribers. Let-
ters and personal interviews have indi-
cated that this advertising service, par-
ticularly with direct-mail helps, not only
is pleasing to subscribers, but has been
used with pronounced success in their
local newspapers.

Tentative plans for the introduction of
a poster advertising campaign were sub-
mitted and the committee was informed
that the Managing Committees of the
Commercial and Industrial Gas Sections
had approved this proposed service.

Plans also were outlined for the con-
templated direct-mail advertising cam-
paign. One piece of direct-mail matter
on hot water has been distributed to
member companies.

After some discussion, the committee
agreed that it would be advisable to in-
stitute a special coke advertising cam-
paign, and, together with the Coke Fact
Finding Committee, now is engaged in
the preparation of twenty advertisements
designed to promote the sale of this com-
modity.

Technical Section

B. V. PFEIFFER, Chairman

H. W. HARTMAN, Secretary

R. G. GRISWOLD, Vice-Chairman

Model Specifications for Welding Pipe

As a direct result of the rapidly increasing use of oxwelded construction for the installation of piping systems for all types of services, there has developed a demand for a set of specifications to insure the correct application of oxwelding for piping installations.

To meet this demand, engineers of The Linde Air Products Company have prepared the model welding specification given below. This specification has been prepared in such a way that it can be added to or incorporated in any general specification for a piping installation.

1. These specifications apply to the welding design and welded construction of the specified piping system and are supplementary to and a part of the General Specifications covering the installation. The general requirements, mechanical equipment and engineering features of the general specification and drawings are in no way affected by these welding specifications which apply only to the substitution of oxy-acetylene welding for other types of joints in the specific piping.

All work under the heading of welding is subjected to the "general conditions" as written for the entire specification, which insofar as they apply to this particular work, are understood to be herein repeated.

2. All piping in general shall be installed with welded joints unless otherwise directed by the architect or engineer.

Welding

3. All welded joints shall be made by the oxy-acetylene process.

4. All pipe shall be commercial grade of good weldable quality, free from defects, in the sizes and thickness required for the installation.

5. Welding rod for steel pipe welds shall be High Test Welding Rod, equal to Oxweld No. 1 or its approved equivalent. For bronze welds and brass pipe welds, Oxweld No. 10 Welding Rod and Brazo Flux or their equivalent shall be used.

6. All welding shall be done by competent welders and in a thoroughly first-class workmanlike manner.

7. The contractor shall be required to furnish proof of the competency of each welder or shall, at the request of the engineer or his representative, before any welding is done, furnish a specimen of a typical steel pipe line welded joint made by each welder in the presence of the engineer or his representative, jointing two nine inch (9 in.) sections of pipe of the largest size to be welded in the installation (6 in. minimum size for these test welds). These

shall be subjected to test by cutting into longitudinal strips one inch (1 in.) wide, so as to contain a portion of the weld, and at least four strips selected at random shall be gripped in a vise with the weld flush with the vise jaws and sledged until fracture occurs in the weld. The fractured weld shall show complete fusion to the bottom of the vee and to the side, and sound weld metal, free from cold shuts, gas pockets or other defects. At the discretion of the engineer, standard A.S.T.M. tensile coupons, cut from the sample welded joint, may be subjected to tensile test and shall show a minimum tensile strength of 45,000 lb. per sq.in. before permission is given for any welder to weld on the installation.

Line Joints

8. All line welds shall be of the single vee butt type for which the pipe shall be purchased mill beveled or machine beveled to 45° to within 1/16 in. of the inside wall. Pipe with wall thickness 3/16 in. or less need not be beveled but may be welded by melting down into and building up over the abutting ends.

9. The abutting ends of the joints shall be separated before welding to permit complete fusion to the bottom without overlapping, tacked in two or more points to maintain alignment, and welded. All welding wherever possible shall be continuous around the pipe.

Butt Welds

10. All welds shall be of sound weld metal, thoroughly fused into the ends of the pipe and to the bottom of the vee, and shall be built up in excess of the pipe wall to give a reinforcement of 1/4 the pipe wall thickness and in such a manner that the weld metal will present a gradual increase in thickness from the surface of the pipe to the center of the weld. The minimum width of the weld shall be 2 1/2 times the thickness of the pipe wall.

Fillet Welds

11. All fillet welds for flanges or fittings shall be fused into the pipe and plate for a minimum distance of 1 1/2 times the pipe wall thickness and shall be built up to present a minimum throat thickness or depth of weld of 1/4 times the pipe wall thickness.

Welded Flanges

12. Standard flange, if of cast or forged steel, shall be welded to the pipe at the back of the flange or by inserting or screwing the pipe within the flange to within 3/8 in. of face and welded both at the front and at the back. Special long hub flanges, de-

signed for butt welding to the pipe or welded flanges with a short stub, may be butt welded to the pipe where flanges are required.

Fittings

13. Tees, branch connections, swages, bends and other fittings, unless otherwise directed by the engineer, shall be fabricated by welding or designed to be welded into the piping system, provided such welded fittings are designed to give carefully matched intersections and properly prepared for welding.

Anchor

14. Anchors shall be constructed of welded shapes welded to the pipe or of the design required by the engineer.

Gas Cutting

15. Fittings and odd lengths of pipe may be cut and prepared by the oxy-acetylene blowpipe, but all cut surfaces to be welded shall be regular and properly cleaned of all oxide by grinding, filing or other suitable method.

Testing

16. All welded piping operating at a working pressure in excess of fifteen (15) lbs. shall be subjected to a hydrostatic test of 1 1/2 times the working pressure, at which pressure all welded joints shall be hammered with a three (3) lb. hammer, the blows being struck with sufficient force to jar the pipe and joint but not so hard as to injure the piping. All welds shall satisfactorily pass this test without showing leaks or any defects.

All welded piping operating at fifteen (15) lbs. or less shall be subjected to a suitable tightness test with air, steam or other medium, under which test all welds shall show no leaks or other defects.

Gas Company Lowers Accidents By Education

THE organized program of safety education being conducted among the employees of The Consolidated Gas Company of New York and affiliated gas companies resulted in a 52 per cent decrease in accidents involving loss of time from work during 1929, according to George B. Cortelyou, president of the company.

What is believed to be a record for utility companies throughout the country was established by the Elizabeth Street branch of the Customers Service Department, which has not had a lost-time accident since January 16, 1927. This branch employs an average of 123 men.

Joint Production and Chemical Conference

ADVANCE registrations indicate that production engineers and chemists of the industry will have not only the largest but the most representative attendance that they have ever enjoyed when the Fourth Joint Production and Chemical Conference opens at the Cleveland Hotel, Cleveland, Ohio on May 21 for a three-day session.

The conference is held under the auspices of the Carbonization, Water Gas and Chemical Committees of the Technical Section of the American Gas Association.

The revised program follows:

First Session

Wednesday, May 21—10:00 A.M.

Chemical Committee Subjects—
Dr. S. P. Burke, Presiding

Opening Remarks, S. P. Burke, Chairman, Combustion Utilities Corp., New York, N. Y.

Welcome to Cleveland, Chas. T. Henderson, East Ohio Gas Company, Cleveland, Ohio.

Recent Developments in Coal Testing, Dr. G. St. John Perrott, Superintendent, Pittsburgh Experiment Station, U. S. Bureau of Mines, Pittsburgh, Pa.

Paper: Experiences with Chemical Evaluation of Gas Oil, J. E. Brewer, Vice-President, Chemical Service Laboratories, Philadelphia, Pa.

Paper: Relationships Between the Petroleum and Gas Industries, H. J. Nichols, Technical Service Division, Standard Oil Co. of New Jersey, Bayway, N. J.

Paper: The Effect on Appliance Operation of Chemical and Physical Variations in the Gas Supply, Dr. F. E. Vandaveer, Supervisor, A. G. A. Testing Laboratory, Cleveland, Ohio.

Second Session

Wednesday, May 21—2:00 P.M.

Water Gas Committee Subjects—
Mr. I. K. Peck, Presiding

Paper: Economics of Reforming of Refinery Gases, C. A. Schlegel, Sales Manager, United Engineers & Constructors, Inc., Philadelphia, Pa.

Paper: The Refinery Gas Reforming Plant at Chester, Pa., R. G. Rinchliffe, Superintendent of Production, Philadelphia Electric Company, Philadelphia, Pa.

SYMPOSIUM—Utilization of Oils for Carburetion.

Paper: Recent Developments in Carburetting Water Gas with Bunker Oils, J. V. Richards, Superintendent, Public Service Electric & Gas Co., Trenton, N. J.

Paper: The Cracking of Heavy Oils and Tars, Dr. Gustav Egloff, Oil Technologist, Universal Oil Products Co., Chicago, Ill.

Paper: A Recent Development in Oil Gas Production, J. A. Harritt, San Diego Gas and Electric Co., San Diego, Calif.

Paper: Present Status of the Dayton Process, Hugh E. Ferguson, Senior Chemist, The Peoples Gas Light & Coke Co., Chicago, Ill.

Paper: Gas Conditioning, C. W. Garrison, Sales Engineer, Western Gas Construction Co., Ft. Wayne, Ind.

Open Forum.

Third Session

Thursday, May 22—10:00 A.M.

Carbonization Committee Subjects—
Mr. Fred Denig, Presiding

Opening Statement, Fred Denig, Chairman, Philadelphia Coke Company, Philadelphia, Pa.

Report: Committee on Survey of Gas and Coke Making Properties of American Coals, J. D. Davis and A. C. Fieldner, U. S. Bureau of Mines.

Report: Committee on Gas Producer Operation, J. S. Haug, Chairman, United Engineers and Constructors, Inc., Philadelphia, Pa.

Built-In Producers, F. J. Kennedy, General Manager, West Gas Improvement Company of America, New York, N. Y.

Underfiring Horizontal Retorts with Bituminous Coal, R. F. Davis, Utilities Service, Inc., Indianapolis, Ind.

Use of Fouled Actifier Air in Gas Producers, M. T. Herreid, Connecticut Coke Company, New Haven, Conn.

Factors Influencing Gas Producer Operation, Dr. G. V. Slottman, Director, Buffalo Station, Massachusetts Institute of Technology, Buffalo, N. Y.

Report: Committee on Test Code for Carbonizing Plants, F. J. Pfluke, Chairman, Rochester Gas & Electric Corp., Rochester, N. Y.

Report: Committee on Plant Waste Disposal, A. R. Powell, Chairman, Seaboard By-Product Coke Co., Kearny, N. J.

Gases, Smoke, Dust and Odors, C. R. Bellamy, Columbia Gas & Electric Corp., New York, N. Y.

Phenol Effluents, E. G. Boyer, Philadelphia Electric Company, Philadelphia, Pa.

Solid Waste and Non-Phenolic Liquid Wastes, A. R. Powell, Seaboard By-Product Coke Company, Kearny, N. J.

Fourth Session

Thursday, May 22—2:00 P.M.

Chemical Committee Subjects—
Dr. S. P. Burke, Presiding

Paper: An Investigation of the Walters Method for the Determination of Naphthalene, J. F. Anthes, Assistant to Chief Chemist, The Brooklyn Union Gas Company, Brooklyn, N. Y.

Paper: Some Chemical and Thermodynamic Effects in the Formation of Organic Sulphur Compounds in Gas Making, W. J. Huff, Professor of Gas Engineering, and J. C. Holtz, The Johns Hopkins University, Baltimore, Md.

Paper: The Application of Optical Pyrometry to the Measurement of Luminous Flame Radiation and Temperature, H. C. Hottel, Department of Fuel and Gas Engineering, Massachusetts Institute of Technology, Cambridge, Mass.

Paper: The Calibration of Large Capacity Gas Meters, T. A. Mangelsdorf, Department of Fuel and Gas Engineering, Massachusetts Institute of Technology, Cambridge, Mass.

Paper: The Design of Chemical and Sample Laboratories for Gas Plants, J. M. Gonder, The Koppers Co. Laboratories, Pittsburgh, Pa.

Paper: The Chemical Control of Gas Manufacture, M. C. K. Jones, Assistant to Superintendent in Charge of Chemical Control, Consolidated Gas, Electric Light and Power Company, Baltimore, Md.

Fifth Session

Friday, May 23—10:00 A.M.

Water Gas Committee Subjects—
Mr. I. K. Peck, Presiding

SYMPOSIUM—Automatic Grates and Chargers.

Paper: The U. G. I. Mechanical Generator, J. S. Haug, Consulting Gas Engineer, United Engineers and Constructors, Inc., Philadelphia, Pa.

Paper: New Developments in the A. B. C. Grate, H. B. Young, Operating Department, Chicago By-Product Coke Company, Chicago, Ill.

Paper: Description and Report of Operations at Kings County Lighting Company, Scott Farley, Superintendent, Kings County Lighting Company, Brooklyn, N. Y.

Paper: Operation of Automatic Grate with Soft Coal, G. T. Bentley, Assistant to Superintendent of Manufacture, Detroit City Gas Co., Detroit, Mich.

Paper: Operation of Automatic Grate with Soft Coal, L. J. Eck, Gas Engineer, Minneapolis Gas Light Company, Minneapolis, Minn.

Paper: Low Cost Manufactured Gas (Description of Plant at Arlington, Mass., with operating results), Walter M. Russell, Gas Engineer, Gas & Electric Improvement Company, Boston, Mass.
 Paper: Plant for Mixing and Distributing Butane-Air Gas at North Manchester, Ind. Heavner.
 Report: Summary of Water Gas Committee Activities, Alan E. Lockwood, Gas Engineer, American Electric & Power Corp., New York, N. Y.

Sixth Session

Friday, May 23—2:00 P.M.

Carbonization Committee Subjects—
 Fred Denig and F. D. Lohr, Presiding
 Paper: The Present Coke Situation, Paul Ryan, Statistician, A. G. A. Headquarters, New York, N. Y.
 Paper: Effect of Coal Washing on Coke Properties, A. C. Fieldner, U. S. Bureau of Mines, Washington, D. C.
 Paper: Coke as a Domestic Heating Fuel, Percy Nicholls, U. S. Bureau of Mines, Pittsburgh, Pa.
 Paper: Present Coke Sizing and Methods of Preparation, H. H. Himsworth, Consolidated Gas Co. of New York, Bronx, N. Y., and E. W. Zimmerman, Koppers Construction Company, Brooklyn, N. Y.
 Paper: Coke Marketing Problems, Alfred Fischer, Semet-Solvay Engineering Corp., New York, N. Y., and Robert R. Tibolt, New England Coal & Coke Company, Boston, Mass.

Procedure in Making Kitchen Efficiency Studies

(Continued from page 200)

dishes. These aids to dishwashing should be incorporated in a unit sink set up, or better still a sink may be invented making such accessories unnecessary. The electric dishwashers now on the market are too expensive for the average medium priced small apartment.

Service Table

The service table selected was chosen largely because of its availability. Its first purpose was to serve as the second drain-board but it is to be used also as a transportation device and auxiliary work place. The height of working surfaces was studied in relation to the height of the worker. Standing erect with arms comfortably relaxed to the elbows she should be able to work without stooping or having to lift her hands above the level of the elbows. The height of the work chair is adjusted to maintain this same relationship when the worker is seated.

Summarizing this kitchen study, Dr.

Gilbreth says, "There are a certain number of suggestions which it is hoped this kitchen will make to the homemaker and to those who serve her in retailing and manufacturing. One is that a home is a complete project and anything in it, no matter how small, must be thought of in connection with this complete project. In a smaller way the operation of the kitchen is a complete project and must be thought through as such. Buying any piece of equipment, large or small, should be considered in its final use; otherwise it is very wasteful.

"The manufacturer must realize that at present he has little knowledge of what the housewife needs. She herself seldom knows what she wants, much less what she needs. The progressive manufacturer must determine the work his product should do and then make that product in such a way that it will do this work for its purchaser most effectively. The homemaker has certain physical and emotional qualities, peculiarities and limitations which he should try to understand and satisfy. He must remember not only that his product is used by a person with individuality but must also fit into a circular work space. Unless manufacturers think along these lines the engineer, architect and home economist will combine on projects to supplant existing equipment in the home."

Completing California Changeover

(Continued from page 201)

changeover has been practically completed in all territories and to date there have been no accidents caused by this changeover. Company officials credit this to the advance preparation made by the company preceding the changeover and to the excellent co-operation afforded by all employees and consumers during the period.

Work is progressing rapidly on the new Standard-Pacific Gas line being constructed from the Kettleman Hills field to Richmond, California. This is a new 26-inch pipe line, capable of transporting 138,000,000 cubic feet of gas daily. From this line will be served the industrial section of Contra Costa County by the Coast Counties Gas and Electric Company.

Stage Set for Natural Gas Convention

(Continued from page 197)

Sheppard, United Gas Company, Houston, Texas.

How to Build up Load in Southern Climates with a Large Percentage of Colored or Foreign Population.

Discussion Leader, L. E. Vogel-sang, San Antonio Public Service Company, San Antonio, Texas.

Selling Gas for Househeating with Straight Gas and Conversion Units.

Discussion Leader, J. J. Brennan, Memphis Power and Light Company, Memphis, Tenn.

The Stag Smoker, "Mardi Gras in May," will be held at 8:30 P.M. in Tip Top Inn, The Roosevelt.

The Ladies will be entertained at Le Petit Théâtre du Vieux Carré, 616 St. Peter Street, beginning promptly at 8:00 P.M.

THURSDAY, MAY 8

MORNING—9:30 O'CLOCK

Tip Top Inn

A Uniform Classification of Accounts

E. N. Watkins, Arkansas Natural Gas Corporation, Shreveport, La.

Application of Degree Day Deficiency to Computing Domestic and Heating Loads

R. M. Redding, Dallas Gas Company, Dallas, Texas.

Gas-Field Studies

E. L. Rawlins, U. S. Bureau of Mines, Bartlesville, Okla.

Development of Larger Industrial Sales

W. M. Little, Cities Service Gas Company, Bartlesville, Okla.

Report of Committee on Chairman's Address

Report of Committee on Final Resolutions.

All convention sessions will be held in the Tip Top Inn. Meetings of the Main Technical and Research Committee and sub-committees will take place in Room C on the Mezzanine Floor of the Roosevelt.

A meeting of the Managing and Advisory Committees will be held in Room G same floor in the Roosevelt.

Where is Natural Gas Going?

(Continued from page 194)

The Chinese are credited with the first use of natural gas long before the discovery of manufactured gas by Von Helmont in 1609 or the natural gas wells of Europe began to attract attention. During a period of Chinese development, which later deteriorated, the Chinese piped natural gas—arising from coal deposits—through bamboo pipes to light the city of Peking. However, it never became popular nor into general use among the Chinese people.

Also, centuries ago, it was the chance discovery of natural gas that led to the building of the temple of the Oracle of Delphi. This came about through the observance of a Grecian herdsman that some of his goats, when they neared a certain spot, began to wander about in an unusual manner. He drew near to investigate and became affected himself from something that arose from the ground.

He ran to the village and told his neighbors. They hurried back in great excitement and all had the same experience—they became talkative and light headed; they acted queerly and their conversation was difficult to understand. The villagers agreed that they were in the presence of some supernatural being and decided that a God was living there. Later they appointed a priestess to communicate with this God and built a temple where persons might go for advice. Thus, the Oracle of Delphi became famous.

In the various parts of the world where natural gas was first discovered, it was in almost every instance regarded as the work of a supernatural agency and in places where the gas became ignited, causing continuous fire, fire worshippers erected temples. The late Dr. I. C. White, state geologist of West Virginia, internationally known scientist, and an honorary member of the Natural Gas Department of the American Gas Association, mentions the fact that in his travels through Asiatic Russia he saw the remains of gas wells that had been used in the temples of fire worshippers at Baku.

The discovery of natural gas in our country has not been without the element of the supernatural. The first

natural gas well in the United States is credited with having been struck in 1820 on the south bank of the Ohio River, within the present limits of the city of Pittsburgh, Pa. Here the proprietors of a salt works, while drilling along the banks of the river in an effort to increase their supply of salt water, discovered, much to the amazement and consternation of the drillers, that one of the wells was discharging a gas instead of the salt water they expected. This development became a matter of serious consequences when the gas ignited and destroyed the entire plant. The owners were greatly rejoiced when they succeeded in plugging up the hole and shutting off the flow of something they considered as little less than Satanic.

The second discovery (although some contend this took place before the above mentioned) was the Fredonia development.

It was not until 1865 that any real domestic use of natural gas began. This resulted in the formation of the first natural gas corporation in the United States, which was known as the "Fredonia Gas Light and Water Works Company." In 1867 natural gas was used as a fuel in twelve houses in Oil City, Pa.

The first long-distance iron pipe in the United States was the two-foot gas line, capable of delivering four million feet of gas, laid from Newton Well to Titusville.

The first record of the industrial use of natural gas seems to be that of its use by a pottery concern in East Liverpool, Ohio, about 1872. In 1873 the fact that gasoline could be recovered from natural gas was discovered. In 1874 a steel and iron company at Leechburn, Pa., made use of natural gas in its plant.

Industrial Business as Regards the Heavy Metallurgical Field

(Continued from page 206)

can only be obtained with the use of furnaces designed and built for natural gas. But in order that gas may be introduced into a plant, it is usually necessary to convert a furnace or group of furnaces from some other fuel to gas. Furnaces in the heavy metallurgical field are usually large and costly

items, and the operator of a plant is unwilling to replace such furnaces with others which, to him at least, are of doubtful value. It is much easier and meets with far less resistance if at the outset, an existing furnace can be converted from say oil firing to natural gas.

While this method of introduction does not bring out the full value of natural gas, it at least brings to the operator of the plant a real conception of what natural gas can do. It is only after the value of natural gas has been established in the mind of plant operators that the introduction of real gas-designed furnaces, automatically controlled and operated, meets with success.

In the older natural gas territories, I believe the stage has been reached where converting furnaces from another fuel is on the decline and the use of real gas furnaces is increasing. We have been helped here by an ever-rising rigidity in specifications on finished product, and ever-increasing competition.

The furnace converted to gas from another fuel, however, has sold and will continue to sell many a plant operator the value of natural gas and open his eyes to what is possible when real gas furnaces are installed.

L. I. Pollitt Accepts Post at Johns Hopkins

L IRVING POLLITT has accepted a place on the Advisory Committee to the Department of Gas Engineering, Johns Hopkins University, Baltimore, Md. Mr. Pollitt conceived the idea of establishing gas engineering in the universities of America and his great personal interest and efforts led the Southern Gas Association to undertake the founding of this work at Johns Hopkins University.

Mr. Pollitt always has been a member of the committee on the Chair of Gas Engineering for the Southern Gas Association and has loyally supported the development of the work. His acceptance of a place on the Advisory Committee of the University is the cause of much pleasure to all the friends of this work.

Monthly Summary of Gas Company Statistics

APRIL, 1930

Issued monthly by the Statistical Department of the American Gas Association
420 Lexington Avenue, New York, N. Y.

PAUL RYAN, Statistician

THE month of February witnessed some further slowing up in sales of manufactured gas utilities, according to returns from companies representing approximately 88 per cent of the manufactured gas industry. As of February 28 the customers of the reporting companies aggregated 8,789,077, while sales for the month totaled 32,307,861,000 cubic feet, an increase of 1.5 per cent from the same month of the preceding year.

With the exception of New England, most sections of the country reported February sales hardly more than, and in some cases less than, the same month a year ago. In the Middle Atlantic States, February sales were approximately the same in both years. In this region New Jersey companies reported an increase of nearly five per cent while in Pennsylvania the gain was more than eight per cent. In New

York State, however, sales were down nearly four per cent.

In the East North Central States, sales for the month gained two per cent but in the South Atlantic and Pacific Coast States there was a decrease of somewhat more than one per cent. In New England however February sales were nearly six per cent greater than a year ago. In this region gas sales for industrial-commercial purposes declined nearly nine per cent, but this loss was more than offset by a gain of four per cent in regular domestic sales and an increase of nearly 40 per cent in gas sold for house-heating purposes. In Massachusetts, despite a decline of 16 per cent in industrial-commercial sales, total sales gained six per cent, the result, in large part of a five per cent gain in regular domestic sales and a 46 per cent increase in househeating sales. In Con-

necticut the gain in this latter class of business was 53 per cent.

Reports received from a group of the larger natural gas distributing utilities, with customers aggregating 1,627,282, indicate a decline of nearly five per cent in February sales as compared with the same month of the preceding year. It is doubtful, however, if all of this decline in sales of the natural gas utilities may be ascribed to general business and industrial conditions, as an appreciable proportion of these companies' output is devoted to such uses as house heating, where consumption is influenced more by climatic and weather conditions than by purely economic factors. During February most sections of the country experienced generally mild weather conditions, which doubtless contributed materially toward some lessening in gas sales for househeating and other domestic uses.

COMPARATIVE STATISTICS OF 145 MANUFACTURED GAS COMPANIES FOR MONTH OF FEBRUARY, 1930

	Month of February			Two Months Ending February 28		
	1930	1929	Per cent Increase	1930	1929	Per cent Increase
Customers	8,789,077	8,597,360	2.2			
Gas Sales (MCF)	32,307,861	31,832,058	1.5	65,676,273	64,126,478	2.4
Revenue (Dollars)	33,649,203	33,483,601	0.5	68,440,790	67,481,220	1.4
Gas Produced and Purchased (MCF)						
<i>Gas Produced</i>						
(a) Water Gas	16,251,592	18,024,220	— 9.2	35,361,786	38,901,547	— 9.1
(b) Coal Gas	2,442,346	2,516,634	— 3.0	5,225,831	5,375,815	— 2.8
(c) Oil Gas	708,290	873,541	— 18.9	1,774,305	1,826,699	— 2.9
(d) Coke Oven Gas	3,838,010	3,604,444	6.5	7,928,935	7,470,718	6.1
(e) Reformed Oil Still Gas	131,183	—	—	298,923	—	—
(f) Total Gas Produced	23,371,421	25,018,839	— 6.6	50,589,780	53,574,779	— 5.6
<i>Gas Purchased</i>						
(a) Coke Oven Gas	9,145,260	7,999,873	14.3	19,261,761	15,978,915	20.5
(b) Oil Still and Natural Gas	248,989	275,536	— 9.7	535,097	578,027	— 7.5
(c) Total Gas Purchased	9,394,249	8,275,409	13.5	19,796,858	16,556,942	19.6
Gas Produced and Purchased	32,765,670	33,294,248	— 1.6	70,386,638	70,131,721	0.4

COMPARATIVE STATISTICS OF 41 NATURAL GAS COMPANIES FOR MONTH OF FEBRUARY, 1930

Customers	1,627,282	1,585,839	3.3		See February	
Gas Sales (MCF)	15,773,244	16,517,646	— 4.5	33,490,703	32,908,307	1.8
Revenue (Dollars)	8,613,244	9,234,236	— 6.7	18,107,453	18,480,036	— 2.0

Associations Affiliated with A. G. A.

Canadian Gas Association

Pres.—Kenneth L. Dawson, Nova Scotia Light & Power Co., Ltd., Halifax, N. S.
Sec.-Tr.—G. W. Allen, 21 Astley Avenue, Toronto.

Colorado Utilities Association

Pres.—H. S. Robertson, Denver Tramway Corp., Denver, Colo.
Sec.-Tr.—O. A. Weller, Public Service Co. of Colo., Denver, Colo.

Empire State Gas and Electric Association

Pres.—William J. Welsh, New York & Richmond Gas Co., Staten Island, New York.
Chairman Gas Section—M. F. Clement, Rockland Light & Power Co., Middletown, Ind.
Sec.—C. H. B. Chapin, Grand Central Terminal, New York, N. Y.

Illinois Gas Association

Pres.—H. T. East, Public Service Company of Northern Illinois, Chicago, Ill.
Sec.-Tr.—George Schwaner, 305 Illinois Mine Workers Bldg., Springfield, Ill.

Indiana Gas Association

Pres.—C. L. Kirk, Citizens Gas Co., Indianapolis, Ind.
Sec.-Tr.—F. W. Budd, Central Indiana Gas Co., Muncie, Ind.

Michigan Gas Association

Pres.—A. I. Snyder, Detroit City Gas Co., Detroit, Mich.
Sec.-Tr.—A. G. Schroeder, Grand Rapids Gas Light Co., Grand Rapids, Mich.

Mid-West Gas Association

Pres.—J. M. Drabelle, Iowa Ry. & Lt. Corp., Cedar Rapids, Iowa.
Sec.-Tr.—Roy B. Searing, Sioux City Gas & Electric Co., Sioux City, Iowa.

Missouri Association of Public Utilities

Pres.—T. J. Strickler, Kansas City Gas Co., Kansas City, Mo.
Sec.-Tr.—F. D. Beardslee, 315 N. 12th St., St. Louis, Mo.

New England Gas Association

Pres.—H. Vittinghoff, Stone & Webster, Inc., Boston, Mass.
Exec. Sec.—C. D. Williams, 41 Mount Vernon St., Boston, Mass.
Chairman Operating Div.—A. S. Hall, Springfield Gas Light Co., Springfield, Mass.

Secretary Operating Division—Paul Buchanan, Hartford Gas Co., Hartford, Conn.

Chairman Sales Div.—J. H. Sumner, Cambridge Gas Light Co., Cambridge, Mass.

Sec.-Tr. Sales Div.—A. M. Slattery, Hoffman Heater Co., Boston, Mass.

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New Jersey Gas Association

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Sec.-Tr.—H. E. Cliff, Public Service Electric & Gas Co., Newark, N. J.

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Southwestern Public Service Association

Pres.—Knox Lee, Southwestern Gas & Electric Co., Marshall, Texas.
Chairman Gas Section—Frank L. Chase, Lone Star Gas Co., Dallas, Texas.
Sec.—E. N. Willis, c/o University Club, Dallas, Texas.

The Public Utilities Association of Virginia

Pres.—C. B. Short, Roanoke Railway and Electric Co., Roanoke, Va.
Sec.—C. O. Robertson, P. O. Box 537, Roanoke, Va.

Wisconsin Utilities Association

Pres.—M. H. Frank, Wisconsin Power & Light Co., Madison, Wis.
Exec. Sec.—J. N. Cadby, 105 Wells St., Milwaukee, Wis.

Twelfth Annual Convention of the American Gas Association
Atlantic City, N. J. - - - October 13-17, 1930

Employment Bureau

SERVICES REQUIRED

Sales Engineer wanted by large public utility in the Middle-West. Experienced in commercial and residential heating. Must be a high school graduate. College graduate from an engineering course preferred. Permanent position. Please state age, experience, education and salary expected. 0158.

Experienced industrial gas salesmen for large operating gas company. 0163.

Salesmen to sell gas to industries. Experienced men preferred. 0164.

Graduate gas engineer wanted by Eastern New York public utility. Five or six years experience in gas production and/or distribution and transmission work in connection with high and low pressure systems. Give age, education, experience and references. 0165.

Sales engineers to handle line of motor operated valves, low temperature pressure and combustion safety controllers. Men 25 to 35 years with college training preferred. Familiarity with process control field advantageous. 0167.

Practical industrial gas engineer experienced in erection and installation of burners and furnaces in industrial plants, capable of developing a new field. About 30 years of age and good personality. Not a high pressure orator, but rather of the type generally accepted as convincing, having a good mind for calculation and appreciating the opinions of others. Salary to start \$200 to \$250. 0168.

Industrial gas sales engineers by Public Utility in Middle West. College graduates in engineering courses preferred. Please state age, experience, education, and salary expected. 0169.

Supervising engineer for large organization with experience in natural gas work and preferably also in valuation and rate making. Splendid opportunity for right man. 0170.

SERVICES OFFERED

Executive with successful organizing and technical experience wants to make a change. 316.

Successful industrial engineer of several years broad experience; also technically trained in production and distribution; college graduate. 317.

Industrial sales engineer with managerial sales experience in natural, mixed and manufactured gas territories in house heating and appliance manufacturing. Prefers East or Middle West location. 318.

Combustion Engineer. Post graduate in chemistry. Specialist in application of gas industrially (manufactured and natural). Long experience in sales engineering with strong background of diversified industrial research. Unusually familiar with gas technology. A practical, resourceful man. Gets along anywhere. Seeks greatest opportunity for service and advancement. 319.

Gas Engineer with technical education and over fifteen years' experience in the design, construction and operation of all types of coal carbonizing plants desires to make a connection where training and experience can be used to advantage. 320.

Gas Sales Executive, now completing a successful three years' load building program of a large Middle West Natural Gas Company. Capable sales executive and organizer with a technical and legal training. 322.

Young man, 32, with eight years experience in number of combination companies, with single firm, desires position of Assistant to Executive. 327.

Distribution, Plant or General Foreman with medium size or small gas plant. Twenty-five years experience in water gas manufacture and distribution work. Married. Good references. South preferred. 328.

Manager-Engineer, technical man, nineteen years experience in coal and water gas operation, distribution, city and industrial plant design and construction; familiar with recent developments in production and modification of gases; now employed, desires change. 329.

Technical and practical gas engineer now employed as manager of small property desires a position as production engineer over a group of properties. Capable of putting gas production and boiler plants on a money saving basis. 330.

Experienced sales engineer specializing in design and sale of carbonization and auxiliary plant equipment. Good organizer, with analytical ability and wide acquaintance in Canada and United States. 332.

Gas engineer having wide experience in all departments of business, construction, manufacturing, distribution, sales and appraisal—also knowledge of the sale and handling of by-products, and having executive experience desires connection as manager or superintendent or as engineer with holding company. Could handle combination gas and electric company. Can furnish best of references. 333.

Industrial and house heating engineer with nineteen years experience in the natural gas industry; capable of compiling manuals and organizing departments with proven results; desires position as such, or manager of small property. 334.

Technical man, age 34, married. Eleven years experience in laboratory and plant control of coal and water gas manufacture. Open for position as chemist, assistant to superintendent or foreman. 335.

Chemical Engineer with Master's degree, experienced research man in engineering and public utility problems, desires summer employment. 337.

Chemical engineer with eight years' experience with large public utilities on gas plant operation, and design of gas and power plant equipment. Experienced in handling men. Desires place as assistant to executive, or industrial sales. Would consider service and sales with equipment manufacturer. Married and now employed. Can leave on short notice. 338.

A young executive with several years' experience in rates, sales promotion, advertising and public relations work is now available. 339.

Engineer, M.S. degree, 10 years' experience in coal processing and allied problems. Particular experience in technical and economic phases of low-temperature carbonization and complete gasification. 340.

Gas Engineer—college education, with nine years' experience in transmission and distribution of manufactured and natural gas. 341.

CONFIDENTIAL SERVICE

A confidential service available to members, whereby those seeking men and those seeking positions may be brought together; a part of A.G.A. service to which all members are entitled, without charge, any time they choose to avail themselves of it. For those who may not desire to advertise, a special qualification form, also confidential, is available, which may be filed for consultation when advising companies seeking the services of executives, engineers, operators, salesmen, and others.

To those replying to advertisers under "Services Required" who have not made a practice of sending typewritten letters of application as well as typewritten qualifications and experience information, it is suggested that they consider this matter in these highly competitive times when a neatly prepared letter may carry considerable weight.

Company and individual advertisers are requested to inform the Employment Bureau immediately a position has been filled or accepted; all advertisements should be received at A.G.A. Headquarters not later than the seventh of the month to insure insertion in the next issue.

Sales Manager with gas and electric company or gas alone. Prefer Connecticut or New York State. Eighteen years' experience. 323.

Over twenty years of experience with one public utility company in all angles of the gas industry are behind the writer of this advertisement. He has been Constructing and Operating Engineer on both Plant and Distribution work, Sales Manager, Advertising and Publicity Manager and a successful handler of employees and the public. He possesses good health and has the qualities of initiative, versatility, adaptability and promotion of goodwill. His natural talents are executive and managerial. He is not shooting at the stars, but desires a position of responsibility where his experience and wide range of activity will be of value to his employer. 324.

Available, new business manager or executive's assistant. Age 35. Married. Graduate Engineer, with coal gas and water gas plant experience and successful industrial gas and house heating management experience in large companies. Have had ten year connection in aggressive companies in the gas industry. 325.

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